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TRANSACTIONS

OF THE

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ROYAL SOCIETY

OF

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VOL. XXXI.

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AND WILLIAMS & NORGATE, 14 HENRIETTA STREET, COVENT GARDEN, LONDON.

MDCCCLXXXVIII.

BOTANY OF SOCOTRA.

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BY

ISAAC BAYLEY BALFOUR,

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With the assistance of other Botanists.

FORMING VOL. XXXI. OF
THE TRANSACTIONS OF THE ROYAL SOCIETY OF EDINBURGH.

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MAP OF SOCOTRA
Professor Bayley Balfour's Expedition in 1880

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PREFACE.

In presenting this account of the Botany of the Island of Socotra to the Fellows of the Royal Society of Edinburgh, some explanation is necessary of how it came about that an expedition for the scientific exploration of Socotra was sent from England, and how it happened that I was connected with it.

In the volume of Reports of the British Association for the Advancement of Science for 1878, page lx, this resolution occurs—

"That Mr Sclater, Dr G. Hartlaub, Sir Joseph Hooker, Captain J. W. Hunter, and Professor Flower be a committee for the purpose of taking steps for the investigation of the Natural History of Socotra; that Mr Sclater be the Secretary, and that the sum of £100 be placed at their disposal for the purpose."

In the Report of the same Association for 1879, page 210, is to be found this—

"Report of the Committee, consisting of Mr Sclater, Dr G. Hartlaub, Sir Joseph Hooker, Capt. F. M. Hunter, and Professor Flower appointed to take steps for the investigation of the Natural History of Socotra.

"The Committee have not held any formal meetings, but have been in frequent communication with each other on the subject. The best time for the exploration of Socotra being from November to March, the Committee were not able to make the necessary arrangements last autumn. Next winter, however, they believe that Colonel H. H. Godwin-Austen, than whom no more competent naturalist could be found, will be able to undertake an expedition to Socotra, and to make a thorough investigation of its Natural History. Colonel Godwin-Austen has applied to the Surveyor-General of India for the use of some of the assistants on his staff, and proposes to make a complete typographical survey of the island during the expedition.

"It is estimated that the total cost of the expedition will be about £300. Of this £100, granted by the Association last year, has been received by the Committee, and deposited in the London and County Bank at interest. The sum of £175 having been devoted to this same purpose out of the Government Fund of £4000 administered by the Royal Society, has been paid to Colonel Godwin-Austen, and has been added to the account at the London and County Bank.

"There remains, therefore, only £25 requisite to complete the sum of £300 which the Committee consider will be required for the expedition.

"The Committee request that the Committee for the investigation of the Natural History of Socotra may be reappointed, with the additional name of Colonel H. H. Godwin-Austen, and that the balance of £25 necessary to complete the estimate of expenditure may be placed at their disposal."

On the 20th December 1879, Sir Joseph Hooker wrote to me that Colonel Godwin-Austen had not been able to go to Socotra as he had intended, and asked me to undertake the exploration. I had at that time just taken up the work of the Professorship of Botany in the University of Glasgow, and could not enter upon an enterprise which would involve my being away from Glasgow after the middle of April, and it was hardly possible to be at Socotra before the beginning of February. I could not, therefore, hope to have more than two months at the most for exploration. Sir Joseph Hooker was, however, satisfied that the time would allow of my obtaining sufficient insight into the natural history of the island to make such a raid justifiable, and accordingly, nothing loath to be the first to unravel some of the mystery which for so long had clung around Socotra, I agreed to start upon a rapid pioneer expedition. There was little time to make any great preparations for the exploration, and many things which under more leisurely conditions would have been done had to be left undone, but having made such arrangements as were possible, I left London on the 9th of January 1880.

How Socotra was reached and the narrative of our movements there will be learned from the subjoined Report, which is taken from that published in the volume of British Association Reports for 1880.

"Report of the Committee, consisting of Mr Sclater, Dr G. Hartlaub, Sir Joseph Hooker, Captain F. M. Hunter, and Lieut.-Col. H. H. Godwin-Austen, appointed to take steps for the Investigation of the Natural History of Socotra.

"Colonel Godwin-Austen having been unable to carry out his intention of going to Socotra, the Committee were fortunate enough to obtain the services of Dr I. B. Balfour, Professor of Botany in the University of Glasgow, for this purpose. Prof. Balfour left this country on January 9, for Aden, and returned home on April 21. As his report of proceedings, &c. (appended), will show, he has, considering the short time (only six weeks) that could be devoted to the investigation of the island, and the inevitable delays and difficulties always attending the first exploration of an unknown country, not only achieved a remarkable amount of success, but has proved how much more rich the island is than was anticipated, and how much is left for future explorers.

"The total expenditure of Prof. Balfour on his expedition amounted to about £420. The Committee having received £100 from this Association, and £300 from the Government Grant Fund of the Royal Society, there remains a debt of about £20 due to Prof. Balfour.

"The Committee request that a grant of £50 may be made to them to enable them to discharge this debt. The balance they propose to devote in aid of the publication of the results obtained by the expedition.

"The Committee consider that the best thanks of the Association are due to Prof. Balfour for having undertaken this expedition, and for the zeal and industry with which he has carried it through.

"The Committee consider that the best thanks of the Association are also due to Brigadier-General Loch, C.B., Resident at Aden, Major Goodfellow, Assistant Political Agent, and Captain Heron, of H.M.S. 'Seagull,' for the great assistance they have rendered to Prof. Balfour on this occasion. The success of the expedition is, as Prof. Balfour informs us, mainly due to the cordial co-operation of these gentlemen.

"Referring to the report of Prof. Balfour, the Committee feel no doubt that in every branch of science considerable results are yet to be obtained by further investigations in Socotra, and are of opinion that a second expedition should be sent out as soon as the necessary facilities can be obtained."

"Report to the Socotra Committee of the British Association for the Advancement of Science of the Proceedings of the Expedition to the Island of Socotra. By Bayley Balfour, Sc.D., M.B., Regius Professor of Botany, University of Glasgow, in charge of the Expedition.

"Having undertaken at the request of the Committee the work of an expedition to the Island of Socotra, for the purpose of investigating its Natural History, I left England on January 9, and joining the French mail steamer 'Ava' at Marseilles, reached Aden on the 24th of that month. I was accompanied by Alexander Scott, a gardener from the Royal Botanic Garden, Edinburgh.

"On arrival at Aden, I met my friend Dr Hay, the Port Surgeon, to whose kindness I am much indebted, and with his aid I was enabled to make a fair collection of the plants of Aden. Captain F. M. Hunter, Junior Assistant Political Resident, a member of your Committee, was not at Aden at this time, having gone to the interior a few days previously, and as he had no prospect of returning to Aden before the expedition left for Socotra, he had left for me a letter of instruction, giving valuable information and hints, the outcome of his personal experiences on the island. In his absence Major Goodfellow, Senior Assistant Political Resident, gave me every assistance, and the attainment of the object of the expedition is in great part due to him.

"The official letters of recommendation to the authorities at Aden from the Home Government, for which the Committee applied, had not reached Aden at the date of our arrival, but having a private letter of introduction from General Strachey to Brigadier-General Loch, C.B., Political Resident, I presented it. General Loch very cordially sympathised with the object of the expedition, and promoted most materially the carrying out of the work of the expedition. In default of instructions from the Home Government he telegraphed to the Bombay Council asking for authority to aid the expedition, and received a very gratifying affirmative reply. He then at once placed the despatch boat 'Dagmar,' of the Bombay Marine, at our disposal to convey us to Socotra, and we were enabled to obtain from the arsenal tents and camp implements. He also very kindly granted leave to Lieutenant Cockburn, 6th Royal Regiment, that he might go with us to Socotra. Lieutenant Cockburn then joined the expedition, and apart from the advantage and pleasure I derived from having him as a companion, the excellent sketches he made will enable the Committee to judge of how great an acquisition he was to the staff of the expedition and of the valuable services he rendered.

"The P. & O. mail steamer arriving on January 26, brought the promised official letters, one from the India Office to the Resident, and another from the Admiralty to the Senior Naval Officer at Aden. As a result of the latter letter, Captain Heron, of H.M.S. 'Seagull,' called upon me on the 27th, and offered to take the expedition to Socotra in his ship. It was

subsequently arranged, therefore, that we should go in the 'Seagull' instead of the 'Dagmar,' and the date of sailing was fixed for February 2.

"The intervening days were occupied in obtaining stores and servants; the latter not easy to procure, especially a good interpreter, on account of the very high rate of pay demanded.

"All our gear was shipped on the 'Seagull' by noon on February 2, and our party—composed of Europeans,—Lieutenant Cockburn, Alexander Scott, and myself; and natives,—interpreter, cook, tent Lascar, general servant, and two coolies—went on board later. Captain Heron purposed to sail that day, but the monsoon blowing strongly up the harbour a start was delayed until next morning. On the morning of the 3rd, though the wind had not much lulled, anchor was weighed and the 'Seagull' steamed out of Aden harbour in the teeth of a stiff breeze. By the afternoon we had made so little way against the wind and current, and were pitching and rolling so greatly, that Captain Heron determined to put back and make for Aden again. The expedition at the outset thus encountered annoying delay, for we remained in Aden harbour until the morning of February 6, when again the 'Seagull' left for Socotra. Heavy weather kept us back, on this our second attempt, and it was not until the morning of the 11th that we sighted Socotra.

"I desired to land at Hadibu, the chief village of the island, where the Sultan has his Court; but as much coal had been expended on the voyage, and the anchorage at Hadibu being reported unsafe, Captain Heron deemed it advisable to anchor in Gollonsir Bay, a bay considered the safest round the island, and at its north-west end.

"From the village sheikh we learned that the Sultan was living at his hill residence, some miles from Hadibu. We therefore sent by messengers the letter of recommendation furnished to us by the Aden Government. But it was not until February 16 that an answer arrived at Gollonsir—an answer of a very satisfactory kind, allowing us to go where we pleased, and charging the village sheikh and the people of the neighbourhood to aid us if possible. Whilst waiting for news from the Sultan, our tents, stores, and baggage were landed from the 'Seagull,' and our first camp was formed on the slope of a hill N.E. of the Gollonsir village, and we entered on our work.

"The 'Seagull' left on February 16.

"Making in the first instance Gollonsir our headquarters, we explored the adjacent country to the S. and S.W., until the 25th inst., when we struck tents, and sending our heavy baggage and stores by sea, started to march to Hadibu. We took four days to accomplish it, reaching Hadibu late on the night of the 28th inst.

"Having communicated to the Sultan the fact of our arrival, he came to Hadibu on March 1, when we had an interview.

"Establishing our depôt now on the Hadibu plain, about a mile from the town, we spent the time until the 7th inst. investigating the magnificent Haggier range of hills shutting in on the south the Hadibu plain.

"On March 6, leaving a tent Lascar in charge of the depôt at Hadibu, we started upon a trip to the eastern end of the island, going eastward along the northern side and returning westward by the southern side of the island. During this trip we reached Ras Momé, the extreme eastern headland. Camp at Hadibu was again entered on March 18.

"As yet we had not seen much of the southern parts of the island, so on March 22 we left Hadibu on our last excursion. Crossing the Haggier range we emerged upon the southern shore at Nogad, traversed the coast line for some distance, and then recrossed the island, so as to come down upon Kadhab village on the north side. We regained Hadibu on the 27th.

"March 28.—The 'Dagmar' arrived this morning, having been sent specially for us by the Resident. We were not sorry to see her, as our camp was now very sickly—Scott was down with fever, one coolie had had sunstroke, and the other servants were all suffering badly from

fever—so much so that for some time previously hardly one of them could work, and we had been compelled to hire some of the Sultan's men.

"Having shipped our collections and gone on board the 'Dagmar,' she left Socotrà on March 30, and after a smooth but tediously slow passage reached Aden on April 3.

"Here on our return we experienced as much kindness as before. General and Mrs Loch extended to me their hospitality at the Residency. Our collections were overhauled and finally packed for transmission to Britain by the P. & O. steamer 'Deccan,' which reached Aden early on April 10. By this steamer I also took passage, and travelling to Brindisi, arrived in London on the 21st. Alexander Scott went by the 'Deccan' to Southampton, which brought him to England with the collections early in May. Lieutenant Cockburn rejoined his regiment at Aden.

"Collections of specimens in all branches of Natural History were made. As may be supposed, I devoted particular attention to the Botany of the island, and there are dried specimens of between 500 and 600 species of flowering plants in the collection, besides some Cryptogams. A certain number of specimens were brought to England alive, amongst them being such interesting plants as the Dragon's-blood tree and the true *Aloe*. A misfortune deprived me of a number of living plants, and on this wise:—Having selected the majority of the more delicate living plants I purposed to bring them with me to London, as thereby they would arrive a fortnight earlier than by going to Southampton. At Brindisi, however, the Custom House officer seized the plants and insisted on their being taken back to the ship, not allowing me even to book them by another steamer which would have taken them more directly to England. Consequently the plants had to travel up to Venice and thence back to Suez before they could be forwarded to Britain.

"Specimens of the gums produced on the island and used in commerce have been brought home. In the zoological collections there are a few snakes and lizards, some birds, freshwater fish, Mollusca, Crustacea, and Insecta of various kinds.

"Some of the land Mollusca have come to this country alive. Two living civet cats I was bringing for the Zoological Gardens died on the way home.

"Illustrative of the geology of the island are about 500 specimens of rocks and minerals from various localities on the island. Igneous, metamorphic, and sedimentary rocks are all represented.

"I regret that I was unable for some time after my return to turn my attention to the distribution of the collections for examination. I have recently, however, done so, and the following gentlemen have kindly consented to examine certain groups:—

Zoological.	Birds,	Mr Sclater and Dr Hartlaub.
	Land shells,	Col. Godwin-Austen.
	Crustacea,	Prof. Huxley.
	Remaining Zoological collections,	Dr Günther and Zoological staff of British Museum.
Geological.	Igneous and metamorphic rocks,	Professor Bonney.
	Sedimentary,	* * *
Botanical.	Algæ,	Dr Dickie.
	Fungi,	Dr M. C. Cooke.
	Mosses and allies,	* * *
	Phanerogamic and Vascular.	Dr Bayley Balfour.
	Cryptogamic plants,	Dr Bayley Balfour.

"The agreement made with the Committee as to the final disposition of the specimens will be carried out, viz., the first set of specimens, zoological, to go to the British Museum; the

first set of specimens, botanical, to go to the collection at Kew; a set of botanical to go to the British Museum. The remainder will be distributed variously. The publication of results is a matter for consideration by the Committee.

"In the foregoing report I have confined myself to a narrative of the proceedings of the expedition. It is as yet too early to speak definitely of what the total results will be. But I think I may safely say, from what I have learnt regarding the birds from Mr Sclater, and regarding the land shells from Col. Godwin-Austen, as well as from what I know of the plant collections, that the results promise to be of exceptional interest. What has been done by the expedition is but a fragment of what there is to be accomplished. In exploring the island, I deemed it better, considering the short time of our sojourn, rather to attempt to cover as much ground as possible, with the view of obtaining a representative collection, than to examine in detail a limited tract of country. By doing this, much barren land was travelled over, and many rich and fertile spots were necessarily only superficially looked at. Especially amongst the hills of the Haggier range are there valleys which would well repay a careful and extended investigation. The expedition just completed ought to be considered only preliminary; I am assured a rich harvest awaits any collector who may visit the island.

"If at any future time an expedition should be sent to the island, it would be well if the date of its arrival were timed so that it should have the last months of one and the first months of the following year upon the island. Our expedition reached the island too late in the year, so that before we left the heat was so intense as to prevent our doing so much work as we desired. Again, the inaccuracy of our knowledge of the geography of the island is a point to which the attention of future expeditions should be directed. The chart based on Wellsted's observations is the only available one, and that is so incomplete and incorrect as to be almost useless to any one moving about the island.

"In conclusion, I desire to express my hearty thanks, and those of the other members of the expedition, to the Committee for their aid. Also to General Loch, C.B.; Major Goodfellow; Dr Hay; Capt. Heron, R.N., and officers of H.M.S. 'Seagull,' and to the officers of the despatch-boat 'Dagmar,' for the very kind way they one and all co-operated to make the expedition successful."

I must take this opportunity of further saying how entirely the expedition depended upon the assistance readily and willingly given by the India Office. By the kind intervention of Mr Thiselton-Dyer and Sir George Birdwood, I was enabled to have an interview with Sir Louis Mallet, who cordially interested himself in the objects of the expedition, and at once promised that everything should be done that could contribute to the attainment of them. His promise was amply fulfilled.

Our collections were distributed in accordance with the statement in the Report above quoted, and I may add to what is mentioned there, that the geological specimens were sent to the British Museum, and the surplus botanical collections distributed amongst the chief herbaria on the Continent.

The list of those who have kindly examined and described our collections from Socotra, so far as these have been published, is—

Zoological.	Birds,	Mr Sclater and Dr Hartlaub.
	Amphisbænians and Ophidians,	Dr Günther.
	Lizards,	Mr Blandford.
	Land Mollusca,	Lieut.-Col. Godwin-Austen.
	Lepidoptera,	Mr A. G. Butler.
Geological,		Professor Bonney.
Botanical.	Diatomaceæ,	Mr F. Kitton.
	Algæ,	Dr Dickie.
	Lichens,	Dr Jean Müller.
	Other Fungi,	Dr M. C. Cooke.
	Muscineæ,	Mr Mitten.
	Phanerogams and Vascular Cryptogams; I am myself responsible for these, but in several groups I have availed myself of the special knowledge of other Botanists, and their help is acknowledged under the respective groups.	

My gratitude is due to the above-mentioned gentlemen for their kind and valuable assistance. The examination of the botanical collections is completed, but I have not yet had reports upon all the zoological ones.

Our 48 days' stay on Socotra and first scientific exploration of the island was soon followed up by a second exploration. In the spring of 1881, Dr Riebeck, accompanied by Drs Schweinfurth, Mantay, and Rosset, arrived at Aden with the intention of proceeding to Socotra. At Aden they received first intimation of our raid of the preceding spring. After a stormy passage of 27 days from Aden in a buggalow, beating up against the north-east monsoon, during which they made landings at three different places, Schugra, Bolhaf, and El-Hami, upon the south coast of Arabia, the German expedition landed at Tamarida on 16th April, and formed a camp at a place Keregnigi, about 800 feet up the Haghier slopes. Thence during the succeeding six weeks excursions were made to different parts of the island, and the expedition left on 18th May. Thus, after an interval of nearly fifty years, Socotra was visited in two successive years by scientific expeditions.

The members of the German expedition devoted themselves largely to the study of the people and language, at the same time that they collected in various branches of natural history. Their zoological collections have been worked up by various authorities. Dr Hartlaub has examined the birds, Prof. Peters has taken the lizards, the Crustacea fell to Prof. Hilgendorf, and Dr Taschenberg* took the insects, while upon Prof. Von Martens devolved the work of determining the land-mollusca. The collection of crania, from which most interesting information may be expected, was placed in the hands of

* Prof. Taschenberg has published, I am informed by Dr Schweinfurth, under the title "Beiträge zur Fauna der Insel Socotra," an account of the zoological results obtained by the German expedition, but I have not been able to find the paper. Dr Hartlaub's and Von Marten's results are referred to on pages xxxi and xxxiii of the Introductory Chapter.

Prof. Welcker. Dr Schweinfurth investigated the botany of the island. On learning that he was on his way to Socotra, I sent him a catalogue of our plant-gatherings, and he was thereby, he states, enabled to give particular attention to filling up gaps in and adding to what we had collected. With a generosity which is pleasing as it is rare, he subsequently sent his collections to me in England, in order that the whole flora might be worked out in one. I have already had opportunity to express publicly my lively appreciation of this act of friendship and self-abnegation, and I wish here to put the fact again on record, and to say how much Dr Schweinfurth's specimens have contributed to the satisfactory working out of the details of the flora. The value of his collection must not be measured either by the number of the species or by the species he found which we had not gathered. In the excellence of his specimens and their completeness, and in the way in which they so frequently supplemented, in flower and fruit characters, deficiencies in ours,—therein lay the value of Schweinfurth's plants, and I cannot appraise it too highly.

The following pages are intended to give a description of the Flora of Socotra as it is known now—the knowledge being derived from the explorations and collections made by Dr Schweinfurth and by the members of our expedition. Specimens from the former source are indicated by "Schweinf." with his collecting number; those from the latter by "B.C.S."—Balfour, Cockburn, and Scott—with our collecting number. Before our expedition no plants were known with certainty from the island save the *Aloe Perryi*, which Mr Baker had described from fragmentary specimens brought by Commander Wykeham Perry and Mr Collins; but in course of working up our collections I have discovered several specimens which had been previously brought from the island, and in the descriptive portion of the flora I have noted the collector's or sender's name. In almost every case such plants have been also found by the later expeditions. I may tell here the history of these former collections.

We have identified all the plants mentioned by Wellsted in his Memoir on the Island (see page xxi), and I have referred to his description under the several species. One plant only, *Romulea purpurascens*, var. *edulis*, which he does not mention in his Memoir, is recorded in Kew Herbarium as having been brought by him from the island.

A number of plants are marked as collected by "Nimmo." These belong to a set in the Kew Herbarium, marked in Sir William Hooker's writing, "Shores of the Red Sea." By the kind assistance of Sir Joseph Hooker, I have found, in Sir William Hooker's correspondence preserved at Kew, that these plants were sent home by Mr Nimmo * from Bombay. Many of the specimens in the

* Of Mr Nimmo I have not been able to find out many particulars. He, as Prof. Oliver points out, completed, from the 200th page, Graham's "Catalogue of Bombay Plants."

collection were obtained from Socotra during the period of its occupation by Indian troops (1834–39). Whenever a plant of this collection is identical with a Socotran one known from no other locality, I have had no hesitation in assuming that the specimen was brought from Socotra; in this way several species are taken out of the tropical African flora.

A few plants have the name 'Boivin' attached. Louis Hyacinthe Boivin was botanist on board the 'Duconadec,' under Captain Guillain, during the exploration of the east coast of Africa (1846–52), and in 1847 the ship was at Socotra for a few days, and Boivin obtained some plants. I have only seen three plants of his collecting, but one of them, *Lagarosiphon Roxburghii*, has been brought from Socotra by no other collector. Possibly in the herbarium at Paris there may be more specimens of Boivin's collection.

Some of the species have the name 'Hunter' attached. These are species which occur in a small collection made by Captain (now Major) Hunter, Assistant Political Resident at Aden, who visited the island in his official capacity in 1876, and presented to the herbarium of the Royal Botanic Garden, Edinburgh, in 1878, by Dr George Hay, Port-Surgeon at Aden.

'Perry' is attached to some species, and refers to plants brought by Commander Wykeham Perry from Socotra in 1876; the chief one being the aloe which is named after him.

'Collins' refers to Mr James Collins, who was Curator of the Museum of the Pharmaceutical Society, and went out many years ago, as Mr Baker informs me, to Singapore to superintend india-rubber plantations. On his way home he obtained the Socotran aloe.

In the introductory chapter, which is in its greater part the address I delivered to the Society, at the invitation of the Council, on 4th July 1881, I have briefly summarised what we know of the history, people, geology, and zoology of the island, giving references to literature where further information may be obtained. Upon the botanical features of the island I have dwelt at greater length. But after all that is said what we know is but a small portion of what there is to know. Besides the many interesting points in the botanical, zoological, and geological features that still await investigation, there is the fascinating problem of race and language yet to solve. Our expedition was, as I have elsewhere said, merely a raid, during which as much information and as large collections as possible were accumulated. My want of knowledge of Arabic and kindred tongues made it difficult for me in the time, and with the means at my disposal, to make satisfactory inquiries into questions which might conduce to the clearing up of the mystery that at present surrounds the origin of the people and their speech. In the case of the German expedition, which was fortunate in being accompanied by so competent an explorer as Dr Schweinfurth, the sojourn on the island was so short that researches

could not be carried out to the satisfactory conclusion they might otherwise have reached.

Thus it happens that at present in this island, over which Great Britain has now openly declared a protectorate, and within but three weeks' journey from England, there dwells a people whose origin is still involved in myth, and of whose speech the true relations are undetermined, who, according to received records, having attained to some degree of civilisation and embraced Christianity, have gone back from their advanced position to the lower state in which we now find them, and thus present to us a feature of exceptional interest in the history of mankind. We must probably wait for materials for a full knowledge of the origin of the Socotrans, until exploration has revealed to us something definite of the people who inhabit the inner and hill-regions of southern Arabia opposite, and then too it will probably be found that the natural-history features of Socotra possess many more points in common with the Arabian mainland than is at present evident. But there is now on Socotra alone a wealth of material for exploration and investigation which would amply reward the work of another expedition; and the island can be visited in any year and at no great expense. When the exploration of south Arabia will be made must depend upon a variety of circumstances. It is difficult to get into the country, but such difficulty as there is should not be insurmountable to a gifted Arabic scholar, and to no one else is an exploration of the region possible. The region contains the key to so many of the problems that puzzle us in connection with the history of the progress of mankind, that one may hope that ere very long it will be added to the realms which are known to us.

I must not end this Preface without expressing the great obligation I am under to Sir Joseph Hooker and Mr Thiselton-Dyer for the privilege of working up the Socotran collections at Kew. Without this the flora could not have been written, and I have made full use of it. I have besides to thank Professor Oliver and his colleagues in the herbarium for the steady help and uniform kindness with which all my applications for assistance have been met. Dealing with a flora presenting so many peculiarities, the advantage of consulting with them and benefiting by their experience has been fully appreciated. To the late Mr Bentham, as well as to Sir Joseph Hooker, I am indebted for opinions upon the new genera. Finally, to Mrs Thiselton-Dyer, Miss Smith, and the Messrs Fitch my thanks are due for the trouble they have taken with the drawings of what were often fragmentary specimens.

The map accompanying this flora is little more than an outline sketch showing the line of our traverses. Haines and Wellsted's chart of the island is very inaccurate, and of no value to any one moving about the island, so that one of the first desiderata in connection with Socotra is an accurate survey.

The Index to the volume has been made by Dr Selmar Schönland, Sub-curator of the Fielding Herbarium, Oxford.

It is now seven years since I returned from Socotra, and some apology to the Fellows of the Society would appear to be needed for the tardy production of this chief result of our expedition. The examination and description of specimens was completed so long ago as 1883, and in the spring of that year my account of the phanerogamic vegetation of Socotra was submitted to and accepted by the University of Edinburgh as a thesis for the degree of M.D. By the end of 1883, as the Council of the Society is aware, the descriptive part of the flora dealing with Dicotyledones was printed, and the remainder was in type shortly afterwards; but delays in connection with the production of the plates, which I need not here further particularise, have prevented the issue, until now, of the volume in its completed form. Late as it is, I hope its pages will be received by the Society as not an altogether unsatisfactory record of a brief botanical investigation of the island of Socotra.

ISAAC BAYLEY BALFOUR.

Oxford, 1887.

INTRODUCTORY CHAPTER.*

Geographical Position, Physical Features, and Geology.†

The island of Socotra lies off the north-east corner of Africa, in lat. 12° 19′ to 12° 42′, and long. 53° 20′ to 54° 30′. Its extreme length from east to west is about 72 miles, and its breadth about 22 miles. From Cape Guardafui 140 miles, it is a little more distant from the Arabian coast (about 500 miles from Aden), and still further away from the Indian Peninsula. It is the most easterly elevation of land on a coral bank lying to the north-east of Africa, upon which, between it and Cape Guardafui, other islands (Abd-al-Kuri, Kal Farun, Samneh and Darzi—known commonly as The Brothers—and Saboynea) of smaller size occur. On no part of this bank is the depth of water over 200 fathoms, but between it and the African coast is a channel reaching 500 fathoms. Around Socotra is a narrow coral reef.

The surface features of Socotra at the present time are those of a mountainous island. The shore line on its southern aspect is, as the map shows, a tolerably continuous one, unbroken by deep inlets or bays. On the northern side occur a few shallow bays at the mouths of the streams, which afford the only

* For general accounts of the island of Socotra, see—

Isaac Bayley Balfour: On the Island of Socotra, in Report of the British Association, 1881. Id.: The Island of Socotra and its Recent Revelations, in Transactions of the Royal Institution of Great Britain, 1883.

H. Capitaine, in L'Explorateur, vol. iii. p. 265.

Guillain: Documents sur l'Afrique Orientale, Paris.

Heuglin, in Petermann's Mittheilungen, 1861.

F. M. Hunter: Socotra, in Bombay Gazette, May 18, 1876.

E. R. Ravenstein: The Island of Socotra, in Geographical Magazine, vol. iii. (1876), pp. 119–124, with map.

Phil. Robinson: Socotra, the New Field for Missionary and Commercial Enterprise. London, Clowes & Son, pp. 1–12, with map.

Georg Schweinfurth: Ein Besuch auf Socotra mit der Riebeckschen Expedition. Freiburg, i. B., 1884.

Alexander Scott: Remarks on the Natural History of Socotra. Edinburgh, 1881.

J. R. Wellsted: Memoir on the Island of Socotra, in Journal of the Royal Geographical Society, vol. v (1835), pp. 129–229.

Also see Articles in Transactions of the Bombay Geographical Society, vols. vi., vii., xv.

† T. G. Bonney: On a Collection of Rock Specimens from Socotra, abstract in Proc. Roy. Soc., No. 221 (1882), pp. 145–148. Id.: On a Collection of Rock Specimens from the Island of Socotra, in Phil. Trans., 1883, pp. 273–294, with plates vi., vii.

anchorage to be obtained around the island, but no one of them is safe at all seasons of the year. On all sides the hills rise with considerable abruptness over a wide area, forming bold perpendicular cliffs of several hundred feet in height, whose base is washed by the waters of the Indian Ocean; but at other places they leave plains varying in breadth up to as much as five miles between their base and the shore. On the south side of the island is the largest of these shore plains—Nogad,—which, extending nearly the whole length of the island, is for miles covered with dunes of blown sand. On the north, plains occur chiefly at the mouths of the streams, and are the sites of the only places which can be called villages.

The internal hilly part of the island may be roughly and shortly described as a wide undulating and intersected limestone plateau of an altitude averaging 1000 feet, which flanks on the west, south, and east a nucleus of granite peaks over 4000 feet high. The whole of this hilly region is deeply cut into by ravines and valleys. These in the rainy season are occupied by roaring torrents, but the majority of them remain empty during the dry season. There are, however, many perennial streams on the island, especially in the central granitic region, where amongst the hills the most charming bubbling burns dashing over boulders in a series of cascades, or purling gently over a pebbly shingle, make it hard to believe that one is in such proximity to the desert region of Arabia. Most of the perennial streams are, in the dry season, fiumaras. The eastern end of the island is most destitute of water; there in the dry season are no streams, and, springs being rare, it is the most arid region.

In its climate Socotra contrasts favourably with the adjacent shores of Arabia and Africa. During the N.E. monsoon, from October to April, it is cool. January and February are the most pleasant months. Rain falls twice in the year, at the changes of the monsoons, at which time the stream-courses are filled with mighty torrents. The temperature, of course, varies much with the altitude, and one may pass in the course of a few hours from the tropical heat of the shore-plains to the cool temperate air of the mountain-ranges. The average temperature on the plains in Jannary is said to be about 70°, but in the hotter months is as much as 86°. On the plateaux the temperature often goes down at night to 52°. The higher peaks are, at least in the cold season, frequently enshrouded in mists, and at night heavy dews fall. The hills are healthy; but on the plains, especially at the changes of monsoons, fever is prevalent.

The fundamental rocks of Socotra are gneisses, both hornblendic and granitoid, belonging, like those of north-west Scotland and of north-east America, to the earliest archæan age. These crop out on the hill slopes and in the valleys, but do not as a rule form the exposed higher parts of the island. Through this fundamental mass cut felspathic granites of varying texture and

containing little besides quartz and felspar which form the central nucleus of fantastic peaks, the highest part of the island. Cutting through both the foregoing series we have other granitic rocks, such as minette, felsite, rhyolite, and also basalt and diorites, in many places forming large dykes, and in others extensive lava-flows. The centres of ejection of these rocks we were not able to determine, and possibly many of them, as in the case of the tertiary volcanic rocks of east Hindostan, have been discharged, not from cones, but as outflows from fissures. Towards the south-east end of the island they are found in greatest abundance, and there they exhibit a very fluidal character. The date of the eruption of these rocks was certainly pre-miocene. An indurated shale (argillite) is found in some localities, notably on Hadibu plain, and with it a little sandstone of uncertain date, but probably representing the well-known Nubian sandstone of carboniferous age. Over all comes a capping of limestone, forming plateaux over wide areas, rising in abrupt cliffs two or three hundred feet high. It is generally of a yellowish or whitish colour, compact, and sometimes slightly dolomitised. It contains numerous Foraminifera, which prove it to be probably of middle tertiary age, or rather later than that of Sinai and the Arabian shores of the Red Sea. The surface of the limestone over extensive districts is rotted and broken into a jagged surface, over which progression is by no means easy, whilst at other spots it forms broad smooth slabs. Subsequent to the laying down of the limestone there occurred further volcanic disturbance, and the limestone is cut through by dykes of basalt and compact trachyte of late tertiary age.

"We have in Socotra, it seems to me," writes Prof. Bonney, from whose account of our collections I have derived the information just given, "evidence of rocks of an immense, and a land surface of a very great, antiquity. Excepting this argillite of uncertain age and limited extent, and perhaps some sandstone (also local), there is no evidence in the specimens before me to show that this island was submerged during any part of the palæozoic or mesozoic period. During the kainozoic it undoubtedly shared in the downward movement which affected so large a portion of the globe in and about the north African and Mid-Asiatic districts; but I should infer that the invasion of the sea commenced much earlier in the Sinaitic peninsula, and think it possible that the topmost peaks of the Haghier mountains were at no time wholly submerged. As it again rose from the waves, perhaps being for a while connected with the African continent, the meteoric forces resumed their work of sculpture, and the waves began their work of insulation. Since then the fauna and flora have undergone their own modifications, but in the Haghier hills we have probably a fragment of a continental area of great antiquity, and of a land surface which may have been an 'ark of refuge' to a terrestrial fauna and flora from one of the very earliest periods of this world's history."

The soil resulting from such petrological conditions is correspondingly varied, correlated with which is a varying character in vegetation and scenery.

In the valleys on the banks of the streams, especially in the granitic region, a deep rich red soil is found, and where there is water perennially it is covered by a luxuriant growth. As the limestone composes the greater part of its superficies, the plateau appears barren. Where, however, the limestone has rotted, a series of nooks and crevices occur, in which, where a soil has collected, an *Aloe*, *Kalanchoe*, or other succulent finds a congenial habitat. But upon the limestone plateau, especially at the eastern and western ends of the island, occur depressions varying in width from some hundred yards up to a mile or more, girt on every side by a cavernous limestone-cliff, with perhaps a narrow outlet through it at one or more points; these, which have all the appearance of lagoons, or at least of enclosed water-basins, are floored now by a rich red soil on which a crop of coarse grass, small herbs, and low trees vegetates. On the shore-plains the soil is light and sandy.

History, Government, and People.*

Socotra was known to Europeans at an early period under the name of Dioscoris or Dioscorida. This name was apparently applied at first, not to the one island we now know as Socotra, but to the whole archipelago of which it is a member. But possibly there is an old reference to the island under another name. On the Deir-el-Bahari monument at Thebes, erected by Queen Hatasou in the eighteenth dynasty, there are representations showing the commissioner of the queen going over the sea to the country of 'Poun' and of 'To Nuter,' and bringing back therefrom amongst other things plants bearing 'Ana,' which is shown as a gum-resin in the form of tears on the stems of small trees. Mariette has identified the land of Poun—Pliny's country of the Troglodytes—with Somali-land, the name being preserved in the modern Bennah, and the To Nuter of the inscription is, in his opinion, the Sacred Islands of Pliny, and the modern archipelago including Socotra.

The author of the Periplus of the Erythrean Sea refers to Socotra as a desolate island inhabited by a mixed population of Arabs, Indians, and Greeks, all speaking Greek, who had come thither in search of grain, and carried on a trade with the west coast of India and with Mokha. The island is frequently mentioned by the early Arab geographers, who account for the Greek population by the story, which Colonel Yule considers a myth, that Alexander the Great, acting on the advice of Aristotle, settled an Ionian colony there, in order to cultivate the aloe. They further state that the

* See, besides general accounts mentioned in note on page xxi:—

Georg Schweinfurth: Das Volk von Socotra, in Unsere Zeit., 1883, pp. 657–669.

F. M. Hunter: Notes on Socotra, in Journal of the Anthropological Institute, vii. (1877), pp. 364–372.

Greeks and other inhabitants were converted to Christianity, and that clergy from Persia regularly visited the island. The population at this time, a few centuries after the Christian era, is put down by some at as much as 10,000, the majority of whom are described as Nestorian Christians and pirates.

In the time of Marco Polo, towards the end of the thirteenth century, the island was a metropolitan see of the Nestorian Church. Many ships visited the island, all vessels for Aden touching there, and the trade was mainly in ambergris, cotton stuffs, and salt fish. The people had the reputation of being enchanters, able at will to raise the wind, to bring back ships, and to produce storms and disasters.

Although so mixed a population lived on Socotra, yet from the earliest times it appears to have been under the rule of the Mahri tribe, dwelling on the opposite coast of Arabia, whose sultan or sheikh lived at Keshin.

In 1503 Fernandez Pereira discovered it for the Portuguese, at which time an Arab sheikh lived in a fort at Zoko (modern Suk), then the capital of the island; but it was not until 1507 that Tristan da Cunha and Albuquerque captured the island for the Portuguese. After four years' occupancy the Portuguese retired from the island, leaving abundant traces of their presence. The remains of a fort on Hadibu plain, and at various places on the south and south-west sides of the island, are most substantial ruins. Their influence is possibly also seen in such names of places as Derafonta and in Feraigey one of the ruined forts; indeed the dialect of Socotra, it is thought by some, may owe part of its peculiarity to a Portuguese basis. At the present time a large section of the inhabitants of the hill-region of the island claim direct descent from the Portuguese. About the date of the Portuguese occupancy the character of Christianity had somewhat changed, and the doctrines of the Jacobite sect were professed.

The evacuation of the island by the Portuguese allowed a return of the Sultan of Keshin, and in his hands it has ever since remained, with the exception of a short occupancy on three several occasions by a foreign race—in 1538 by the Turks, in 1800 by the Wahabbees, and by the British from 1835 to 1839.

Although the ships of the East India Company frequently called at the island during the seventeenth century,—some meeting with a friendly reception, others finding the reverse,—and carried on a small trade in aloes and dragon's-blood, it was not until the year 1800 that affairs in the East directed the attention of the British Government to Socotra as a desirable possession, and the commander of the naval station in that region was directed to seize it. This was not done, and it was only the necessity for a coaling station that induced the Indian Government in 1834 to survey the island. This was accomplished by Captain Haines and Lieutenant Wellsted, and the result of the survey being satisfactory, the Government attempted to buy the island, but

failing to do so it was seized in 1835 by Indian troops, who formed an encampment on Hadibu plain, the trenches around which are still visible. The occupation was of short duration. Aden having been taken in 1839, and being more suitable as a coaling depôt, Socotra was abandoned.

The exploration of the island by Wellsted supplied us with the first and indeed until now only detailed account of the island, its people, and productions; the only available chart at present is the one made during this exploration, and it is most imperfect.

After its abandonment by the British in 1839 there are few records of Europeans visiting the island. In 1847 the French exploring brig, "Duconadic," under Captain Guillain, and with the French collector Boivin on board, touched at the island for a few days; but except for an occasional shipwreck bringing it into notice, one reads nothing about the island until 1876, when a prospect of its being occupied by another European nation caused the British Government to turn attention to Socotra, with the result that in that year a treaty was concluded with the Sultan, by which he binds himself, and his heirs and successors, "amongst other things, to protect any vessel, foreign or British, with the crew, passengers, and cargo, that may be wrecked on the island of Socotra or its dependencies, and he receives an annual stipend of 360 dollars for this."* The "other things," it is understood, include a promise never to cede Socotra to a foreign power, or to allow a settlement on it without consent of the British Government. Thus the Sultan is a feudatory of Britain.

The attention of naturalists had long been directed to Socotra as a field for investigation whence rich results might be obtained, and Major Hunter, who visited the island in connection with the concluding of the treaty just mentioned, brought back such encouraging accounts that Dr Sclater in 1878 laid the matter before the British Association for the Advancement of Science, as is mentioned in the Preface, and eventually I was intrusted with the scientific exploration of Socotra. A year later, Dr Riebeck, ignorant of our expedition, arranged for and carried out another expedition to the island, particulars of which will also be found in the Preface.

The government of Socotra is in the hands of the Sultan of Keshin and Socotra. At present two brothers are joint Sultans, and one lives at Keshin, the other resides in Socotra. They are nephews of the one who, in 1834, refused to sell the island to the British. The Sultan has complete sway in Socotra. He has a residence on Gharriah plain, at the base of the Haghier hills, and has also a palace in Tamarida, where he dispenses justice. Under him, each of the large villages has its sheikh or head, and the island is divided into four sections, each of which is in charge of a ranger. The Sultan alone

* F. M. Hunter: An account of the British Settlement of Aden in Arabia. London, Trübner and Co., 1877, p. 158.

has power to inflict punishment. In each section the land is let out to the various tribes of Bedouins, both for pasture and for the collection of gum, payment therefor being made in ghi. The Sultan reserves for himself one portion of land for the collection of dragon's-blood.

The trade of the island at present is small, ghi being the chief export. It is carried on by buggalows from the Arabian coast. Major Hunter* says—"These arrive in the first months of the year with coffee, rice, and other articles, which they exchange for ghi, aloes, orchella weed, &c., which they take to Zanzibar, and, on their return, they bring coco-nut, bombé, and American piece-goods. They dispose of as many of these as possible, and take outwards ghi, aloes, dragon's-blood, blankets, &c., and return to Arabia. Pearl-fishers from the Persian Gulf at times visit the island and dispose of their pearls. The Sultan takes tithe of all exports. From ghi his revenue is about 500$, aloes bring him 250$, edah gives 80$, and other sources bring it up to 1000$ a year, which with his stipend of 360$ from the British, makes him a comparatively rich man in this region."

The extent of the population it is impossible to estimate, as so many people live in caves, and one only occasionally comes across the wandering inhabitants of the hill region. The number has been set down as low as 4000 and as high as 10,000.

In speaking of the people, the dwellers on the shore must be distinguished from those on the hills. The former, who are a mixed population of Arabs, Indians, and Africans of various tribes, live in small villages. Of these the chief one is Tamarida, on the extensive Hadibu plain at the base of the Haghier range of hills. It is the capital of the island, and consists of a number of stone-and-lime houses, of the ordinary construction seen in Arabia, all plastered outside of a dazzling white, and surrounding a large one, which is the Sultan's palace. Around the town is a dense date-grove. There is a mosque and well-filled cemetery in the centre of the town. The number of inhabitants is set down at about 400. Kadhab is another village, lying on a sandy spit east from Tamarida. The houses here are of the same character as at Tamarida, and there is a mosque. Gollonsir, at the west end, is a penal settlement, and has but few houses. Formerly, the capital of the island was Suk, at the east edge of the Hadibu plain, but it was destroyed. There are numerous small villages all along the coast line, but the three mentioned are the chief.

The chief occupation of the residents in these villages is fishing. They cultivate small tracts of ground near their houses, but are, as a rule, idle. The population too is somewhat changing, many going off in trading buggalows to Zanzibar or the Arabian coast.

* I am indebted to Major Hunter's Manuscript Journal, which he very kindly placed at my disposal, for the information which is quoted from him.

The inhabitants of the hills, 'Bedouins,' as they are called, are very different people. They are regarded as the aborigines of the island, the true Socotrans, and alone possess any great interest ethnologically. They are mostly troglodytes, but here and there live in small huts, with stone-and-lime walls and roofed with date-palm leaves. They are a most peaceable race of people, and are divided into numerous families belonging to a few principal tribes. A study of these tribes would well repay the time and trouble spent upon it. Major Hunter says:—"The 'Karshin,' who inhabit the western end of the island, claim to be descendants from the Portuguese. The 'Momi,' who reside in the eastern end of the island, are said to trace descent from the aborigines and the Abyssinians; whilst the 'Camahane,' who live in Haghier and the hills above the Hadibu plain, claim to arise from the intermarriage of the aborigines with the Mahri Arabs from the opposite coast. Whatever be their origin, certain is it that the hill-people have a very distinct appearance. Many of them are tall and finely made, the men with broad shoulders, lean flanks, and stout legs, reminding one very forcibly of the European build. Thin-lipped and straight-featured, they have straight black hair. The women are many of them very good-looking, somewhat resembling gipsies, but they have rather large hands and feet."

Schweinfurth, like Vicenzo in the seventeenth century, recognises two races in these hill-people,—a darker with curly hair, and a lighter one with straight hair. In addition he finds an apparently Semitic type, which he thinks may be traced to a Greek source, characterised by small head, with long nose and thick lips, straight hair and lean limbs. The Socotran is generally, he says, of average height and size, with a quick intelligent eye, and of quite a different type from that of the Somali, Galla, Abyssinian, south Arabian, and coast Indian. From the little known of the Mahri and Qara tribes which inhabit the hill region of middle south Arabia opposite, Schweinfurth is inclined to consider the Socotran as resembling them most nearly.

The men wear a loin-cloth, one end of which is commonly thrown over the shoulder, usually with a knife stuck in the waist, and they invariably carry a stick. The woman have the ordinary Arab blue skirt, in most cases kilted at the knees and confined round the waist by a girdle. In some cases, however, they improvise a petticoat of the coarse blankets they themselves weave, and wear on the upper part of the body a loose tunic with short sleeves. They go unveiled. The women wear the hair done up in two plaits which hang down their back, but in front the hair is cut to form a short fringe on the forehead. Their ornaments are few. The men often wear an armlet of silver. The women have necklets of amber, glass beads, dragon's-blood tears, or in some cases rupees, and have also the ordinary Arab silver armlet and ear-rings.

The occupation of these people is chiefly pastoral. Their herds and flocks

are extensive. From the milk they make quantities of ghi by a simple process of churning—merely continuous jerking of the skin-mussocks—and they sell it to the Arabs of the coast, or exchange it for rice, dates, or other necessaries. They collect also dragon's-blood and aloes, but the latter only in great amount when pasturage fails them. The women spin a coarse thread from the sheep's wool, which they weave into blankets.

Old voyagers speak of horses being used, but there are none now. The cattle are small, and have no hump. Immense herds are found at the eastern end of the island. The sheep are all fleeced, but there are none of the Berbera kind. Of goats there are some in a wild condition. The camels are much smaller than those at Aden and elsewhere in Arabia, and are able to climb like goats; many are kept for milking. Asses roam wild in herds all over the island.

Of plants cultivated on the island the most important is the date-palm. Every stream on the island is lined by groves of them, and the fruit is used, both ripe and unripe. Melons are grown, as also small onions. Little cereal culture is indulged in. Here and there on the hills beside a stream, a small enclosure of 'bombé' (jowari) may be seen, but the inhabitants are too lazy to cultivate to any extent, the watering requiring too much labour. Only in one spot did we observe an attempt at irrigation.

The hill-people live very miserably. Milk forms a large portion of their diet. Bombé is used when grown. Rice is obtained from the coast Arabs. Date is a staple of food. On great occasions a sheep or a kid is killed.

The furnishing of their dwellings is very meagre. Blankets are their couches. Goat-skin mussocks are used for water and milk. They have also earthenware pots, moulded by the hand out of the clays and lime of adjacent rocks.

Their language is peculiar. Major Hunter says of it—"I could trace no affinity to any of the languages of the neighbouring coasts. It sounds a little like Ki-swahili, but not so soft. It is not Mahri, for the Sultan said it in no way resembled it. The sound is not so guttural as Arabic, and seems to require less effort in enunciation." Schweinfurth, on the other hand, noting the many foreign elements the language contains, especially in the names of plants and animals, many of which have a thoroughly Greek sound, says that it resembles the Mahri dialect, and that a comparison of the vocabulary he made of Socotran words with the results of Von Maltzahn's study of Mahri shows analogies.

"Religion sits lightly on a Bedouin. All are Mussulmen, but they only pray when they have an audience, and even in the very act of prostration they will turn round and join in the conversation, and again continue their devotions until the requisite outward observances have been completed."

The fact that the Wahabbees visited the island accounts probably for the absence of the many churches, or traces of them, said to exist in ancient

times on the island. Wellsted observed some ruins, believed to be of a church. There are, however, still evident the ruined forts of the Portuguese. The largest of these is at Feraigey. No written records have been found; possibly such would disappear along with the churches. Wellsted speaks of inscriptions on the rocks being visible. None of these were seen by us. But on the Kadhab plain there occurs a broad slab of limestone, about 50 yards long by 25 to 30 yards broad, whereon numerous hieroglyphics are cut. The figures are not in line, and they lie at all angles to one another and at varying distances. Some resemble foot-imprints, others distinctly represent a camel, or are like St Andrew's cross; Schweinfurth traced in some of them combinations of Greek characters.

Zoology.

Of zoological features one of the most striking is the paucity of indigenous mammals. The antelopes and rodents of the adjacent continents are absent from Socotra, and there are but two mammals indigenous: a bat—of which, unfortunately, we did not obtain a specimen—and a civet cat, a type widely dispersed in south Asia and tropical Africa. Rats and mice occur in the villages, but are probably introduced. Birds are plentiful, so are lizards, and there are some snakes. The rivers are stocked with fish, and in them crabs are also found in abundance. Land-mollusca are, as might be expected, frequent, and the whole island teems with insect life.

Considerable interest attached to an investigation of the avifauna of Socotra. It is well known that in several Indian Ocean islands, large so-called wingless birds formerly existed, several of which have become extinct within recent historical time. The Epiornis of Madagascar, the Dodo of Mauritius, the Solitaire of Rodriguez are examples. Vague rumours credited Socotra with the possession of a didine bird of like character; Wellsted in his account of the island speaks of it as a cassowari. Of such a bird no traces exist at present, nor could any legendary reference to such a bird be discovered.

As at present known, the avifauna includes forty-three species. On the shores we find gulls and herons, on the streams wild-duck and plovers; the date-groves are tenanted by doves and pigeons; whilst all over the island weaver birds, chats, shrikes, sunbirds, and sparrows abound. Cuckoos and falcons are occasionally met with, whilst in the vicinity of habitations the scavenger-hawk of the East and a carrion crow are ready to perform their offices. A few quail occur on the plains. All the birds except the Passeres, Picarieæ, and Columbæ, are of wide distribution. The Passeres are the most numerous of all, and include seven species not known from other regions, and two of these belong to a new type of sparrow—*Rhynchostruthus*—characterised by the massive form of its bill. The sunbird, as might be expected, is new,

and is of interest from having no metallic colouring on its plumage. A small lark on the plains has a peculiar plaintive note, but the song-bird of the island is a new starling, its melody equalling that of a thrush.

Mr Sclater and Dr Hartlaub,* writing about our collection of 36 species—which it may be noted in passing was added to by seven species by the German expedition, one of the species brought being a second one of the new genus *Rhynchostruthus*—say: "The collection shows at once that, so far as one can judge of it by its birds, Socotra, as might have been anticipated, belongs to the same fauna as north-eastern Africa. The island has, however, been sufficiently long separated from Cape Guardafui to allow of a certain number of species becoming differentiated, unless indeed, as is not improbable, these shall be hereafter found to exist also in Somali-land, the ornithology of which is still very imperfectly known to us. Our impression is, that *Rhynchostruthus* will yet be found on Cape Guardafui."

The Amphisbænians and snakes of Socotra, though few in number, are of considerable interest. Dr Günther writes†—"We might have expected, from the geographical position of Socotra, that the species would show a close affinity to, if not identity with, those of the nearest portion of the mainland of Africa; but, in fact, this affinity is overbalanced by that to the Arabian fauna, at least so far as the few species enumerated here are concerned. The most singular fact is, that three out of the four species seem to be peculiar to the island, two being so much differentiated as to deserve generic distinction.

1. The Amphisbæna belongs to a distinct genus, the nearest allies of which inhabit eastern and western tropical Africa.

2. The Coronelline snake, *Ditypophis*, belongs to a distinct genus, apparently approaching the Circum-Mediterranean *Tachymenis vivax*.

3. The Socotran species of the Circum-Mediterranean or central Asiatic genus *Zamenis* is most nearly allied to the Arabian *Z. elegantissimus*.

4. Finally, the viper of Socotra is identical with a species hitherto found in Arabia and on the shores of the Dead Sea."

Of the lizards ten species are known from Socotra. Six of these, discovered by our expedition and examined by Mr Blandford,‡ yielded three new species, and of the three known forms one is found at Muscat and at Bushire in the Persian Gulf, another is a Senegal and north Abyssinia form, and the third is reported from Madagascar.

* P. L. Sclater and G. Hartlaub: On the Birds collected in Socotra by Prof. I. B. Balfour, in Proc Zool. Soc., January 18, 1881, pp. 165–175, with plates xv.–xvii. Dr Hartlaub's account of the birds collected by the German expedition will be found in Proc. Zool. Soc., London, 1881, p. 953.

† A. Günther: Description of the Amphisbænians and Ophidians collected by Prof. I. Bayley Balfour in the Island of Socotra, in Proc. Zool. Soc., April 5, 1881, pp. 441–463, with plates xl. and xli.

‡ W. T. Blandford: Notes on the Lizards collected in Socotra by Prof. I. Bayley Balfour, in Proc. Zool. Soc., April 5, 1881, pp. 464–469, with plate xlii.

Great interest always attaches to the land and fresh-water mollusca of a large and ancient island, and in this feature Socotra is not disappointing. Lieut.-Col. Godwin-Austen records forty-eight species in our gathering from Socotra, and of these a large portion are endemic. Amongst the land-shells some of the genera have very instructive distribution. Thus *Otopoma* is restricted to the east African islands and Arabia; *Lithidion* has the same area, but extends to India; *Cyclotopsis* is represented outside Socotra only in India and the Seychelles; whilst *Tropidophora* is known from Madagascar alone. Writing of the land-shells, Lieut.-Col. Godwin-Austen says:*—"Judging from the land-molluscan fauna of Socotra, there is strong evidence that the island was once directly connected with Madagascar to the south. We know the great antiquity of that island; and it is not unreasonable to suppose that in Socotra, the Seychelles, Madagascar, and Rodriguez, we have the remnants of a very ancient more advanced coast line on this western side of the Indian Ocean, which line of elevation was probably continuous through Arabia towards the north. With an equally advanced coast on the Indian side, the Arabian Sea would, under these conditions, have formed either a great delta, or narrow arm of the sea, into which the line of the Indus and Euphrates drained. Such conditions would have admitted of the extension of species from one side to the other, which the later and more extensive depression of the area, as shown in Scinde, afterwards more completely shut off."

And again he says,† when dealing with the fresh-water mollusca,—"The fresh-water shells we have before us have certainly more of an Indian character than an African one; and, again, as I pointed out in a previous paper, they extend to Madagascar and the Mascarene Islands to the south. In fact, the only species in the present series that has an African habitat is the extremely wide-spread *Melania tuberculata*. *Planorbis cockburni* may be also African; but it is a form of a group of that genus which has a greatly extended range in time and area. It seems remarkable that four fresh-water shells of common and abundant Indian species, only one hitherto known from Africa should be found isolated in Socotra; and this, I think, is another point in evidence of the area of the Arabian Sea as far south as a line joining Madagascar and Ceylon having been once, to a great extent, dry land, receiving the drainage of the surrounding mountain-ranges, of which Socotra formed a portion of the western watershed and the limit of its fresh-water fauna, this watershed being then continuous with the Jebel Yafai and the highlands of Arabia."

* H. H. Godwin-Austen: On the Land-Shells of the Island of Socotra, collected by Prof. Bayley Balfour,—Part I. Cyclostomaceæ, in Proc. Zool. Soc., Feb. 1, 1881, pp. 351–258, with plates xxvii. and xxviii.; and Part II. Helicacea, in Proc. Zool. Soc., June 21, 1881, pp. 802–812, with plates lxviii. and lxix.

† H. H. Godwin-Austen: On the Fresh-water Shells of the Island of Socotra, collected by Prof. Bayley Balfour, in Proc. Zool. Soc., January 16, 1883, pp. 2–8, with plates i. and ii.

Prof. Von Martens,* who worked out the land-mollusca collected by the German Expedition, questions the identifications upon which Godwin-Austen bases his view of the connection of Socotra with Madagascar. Upon this Godwin-Austen remarks (l.c., p. 3):—"Herr Von Martens, the recorder of the molluscan portion of the Zoological Record for 1881, does not quite agree with me in connecting Socotra with Madagascar, considering the species I placed in *Tropidophora* to belong rather to *Lithidion*. On looking again at these shells, the form of the operculum of *T. socotrana* is certainly similar to that of *Otopoma;* but that of *Lithidion* is nearer to *Cyclotopsis* and *Tropidophora* (Arabia and Socotra)."

In speaking of the Lepidoptera collected by us on Socotra, Mr A. G. Butler† points out that the twenty-four specimens are "referable to thirteen species, of which eleven are Rhopalocera; seven of the species are new to science. Of the known forms in this series one is cosmopolitan, two are found in Europe, Asia, and Africa, one throughout Africa, one in south-west Africa and Abyssinia, and one (with trifling differences) in south Africa. Of the new forms five are allied to previously recorded types from the following localities:—one from the Comoro Islands, one from south-west Africa, one from Zanzibar, and two from Arabia. Without the help of these last two, it would therefore be impossible for any one not acquainted with it to guess at the locality from which this collection had been obtained."

We have not a sufficiently extensive knowledge of the fauna of Socotra or of that of the adjoining mainlands to enable us with advantage to discuss in detail the affinities. It is probable that there is a considerable endemic element, and what we do know indicates in some groups strong north-east African connections, in others relations with the faunas of other islands in the Indian Ocean; whilst in other groups a preponderance of Arabian and south-west Asiatic forms is visible, as well as a distinct strain of Indian and Eastern resemblances.

Vegetation and Flora.

The vegetation of Socotra varies greatly in aspect with the character of the rocks. Starting from the shore one finds no representative of a marine phanerogamic vegetation, although in the stagnant brackish waters at the mouths of the streams naiads occur. The coast is not favourable for seaweeds, being too shingly and sandy.

* E. von Martens: Land Schnecken von Sokotra, in Nachrichtsbl. d. deutsch. Malekol. Gesellschaft, No. 10 (1881);—Id.: Mollusken von Sokotra, Conchologische Mittheilungen, Bd. ii. pp. 140–152, tt. 28–29.

† A. G. Butler: On the Lepidoptera collected in Socotra, by Prof. I. B. Balfour, in Proc. Zool. Soc., January 18, 1881, pp. 175–180, with plate xviii.

On the dry sandy plains the vegetation typical of the desert regions on the mainland reigns. We have, for example, dwarfed undershrubs, with hard woody short stems and densely-set short branches, often quite white with down and hairs, and ending frequently in hard spinose points, such as *Breweria fastigiata, Indigofera intricata, Neuracanthus aculeatus, Ochradenus baccatus, Pulicaria stephanocarpa;* or herbs with hard-wooded stock deeply rooting and with main branches gnarled and clustered in masses on the surface of the ground, from which perhaps a few long twigs shoot up stiff and erect, or straggle over the adjoining soil, as in *Indigofera nephrocarpa,* species of *Heliotropium, Lavandula Nimmoi, Diceratella incana, Farsetia longisiliqua, Barleria tetracantha,* and others; or undershrubs or herbs with prickles or spikes of some kind, as in *Capparis spinosa, Fagonia cretica, Balsamodendron Mukul, Crotalaria spinosa, Acacia socotrana, Lycium europæum, Blepharis spiculifolia, Barleria tetracantha, Neuracanthus aculeatus* and *N. capitatus, Lasiocarys spiculifolia, Asparagus africanus,* and others; or fleshy plants with foliage scarcely developed, or itself fleshy, as in *Capparis aphylla, Vitis subaphylla, Statice axillaris* and *S. cylindrifolia, Socotora aphylla, Boucerosia* sp.; or wiry annuals, such as *Cleome tenella, Silena apetala, Linum gallicum, Polycarpæa* sp., *Linaria hastata, Oldenlandia* sp. Aromatic odours are a marked feature in many plants, as in *Plectranthus* sp., *Lavandula Nimmoi, Balsamodendron* sp., *Cleome* sp., and others; and also the occurrence of gums and gum-resins, which in some cases appear as natural exudations in the form of tears, as in *Acacia socotrana, Jatropha unicostata, Euphorbia obcordata, Balsamodendron* sp., *Dorstenia gigas.* Over all, and giving quite a character to the whole landscape, is the glaucous-grey colour, due either to a waxy bloom on the more leathery and fleshy forms, as *Mœrua angolensis, Vitis subaphylla, Osyris arborea, Vogelia pendula,* and others, or to the more common presence of a hairy covering of some kind. Quite the larger number of the plants have such clothing, and thus the vegetation is characteristic of desert regions. The flora of these tracts is that of the Arabo-Saharan district, such genera abounding as *Farsetia, Cleome, Fagonia, Corchorus, Heliotropium, Indigofera, Crotalaria, Breweria, Balsamodendron, Anticharis,* and others. The effect of the plain (desert)-climate and conditions upon the habit of plants is particularly well exemplified in some species upon the island which are found growing both on the plains, and also on localities upon the hills in circumstances of a less rigorous character, for example, in *Vernonia Cockburniana, Aerua microphylla, Lavandula Nimmoi, Dirichletia obovata, Placopoda virgata,* and others; in the former position they have the characteristic desert-type, in the latter they lose the hardness in their wood, and the gnarled feature of the branches also disappears, flexible twigs, with large and delicate leaves, tend to develop, and glaucousness lessens.

Leaving the plains, and passing to the hill-slopes and valleys, plant-life is

more vigorous, but in no place sufficiently so to call for the designation of forest, nor is there anything in the way of fine timber. But in the valleys, wherever there is any degree of moisture, small trees of some 20 to 25 feet, with smaller shrubs packed so densely as to exclude the light from above, linked together by far-reaching lianes, and underlain by a thick under-scrub of fern and herb, make an almost impenetrable thicket, and produce a verdure quite tropical in its luxuriance. In this district the flora is of a tropical old-world type, having representatives of such genera as *Elæocarpus, Grewia, Boswellia, Ormocarpum, Dirichletia, Mussœnda, Sideroxylon, Euclea, Jasminum, Secamone, Porana, Orthosiphon, Clerodendron, Lasiosiphon,* and various genera of Acanthaceæ.

Once out of the valleys and upon the plateaux the scene is essentially different. Wide barren stretches of grey limestone, or undulating prairie-like downs, extend on every side unrelieved, save by an isolated *Dracœna,* or tree-euphorbia of stiff erect habit, looking like the remnant of the vegetation of of some old geological epoch, or where a lake-like depression, with its brown earth sparingly coated with green herbage, often of rank luxuriance, intervenes. And when we reach the higher altitudes on the granitic range, the vegetation impresses one at once with its sub-temperate character. The arborescent type has almost entirely disappeared. Shrubby composites, such as species of *Psiadia, Pluchea,* and *Euryops,* and succulent forms of *Senecio* are found, also crowds of *Helichrysum* many of them strongly aromatic, and scenting the air under the stimulating sun-rays; and quaint types, such as those of *Thamnosma, Nirarathamnos, Graderia, Cephalocroton, Cocculus Balfourii,* and others, are frequent; twiggy narrow-leaved herbs form a dense deep carpet on the soil, interrupted here and there by a protruding lichen-covered boulder, and for all the world like the covering of heather on a northern moor; whilst within the shade of the boulders, or in the moisture of the overhanging cliffs in the ravines, bright green herbs, such as species of *Galium* and *Gypsophila,* nestle in beds of liverwort and moss.

The flora, as we know it, is a pretty extensive one, much more so than was anticipated. It comprises 828 species, and of these 575 are Phanerogams and 253 are Cryptogams.

Of the 575 Phanerogams, the ten following plants, which had been evidently planted where they were found or were only recent escapes from cultivation in the vicinity of habitations, may be deducted from the total before making a further analysis, viz., *Gossypium barbadense, Ruta graveolens, Citrus Aurantium, Indigofera tinctoria, Tamarindus indica, Fœniculum vulgare, Ocimum canum, Ricinus communis, Phœnix dactylifera, Borassus flabelliformis.* Amongst the remaining 565 species of Phanerogams are many which are undoubted introductions and weeds of cultivation; but as they are to a greater or less degree established on the island, and may in time form important constituents

of the vegetation, I do not exclude them from the total for analysis. In the descriptive flora which follows, all plants introduced as well as indigenous which were found are recorded. The following table indicates the distribution of Socotran plants amongst the several groups of the vegetable kingdom :—

TABLE SHOWING THE GENERAL COMPOSITION OF THE FLORA OF SOCOTRA.

	Total Species known from Socotra.		Endemic Species.		Total Genera known from Socotra.		Endemic Genera.		Orders.	
Phanerogamæ	565	...	206	...	314	...	20	...	81	...
Dicotyledones Polypetalæ	...	189	...	61	...	100	...	5	...	33
,, Gamopetalæ	...	213	...	105	...	125	...	12	...	25
,, Monochlamydeæ	...	63	...	24	...	36	...	2	...	12
Monocotyledones	...	100	...	16	...	53	...	1	...	11
Cryptogamæ Vasculares	19	19	2	2	12	12	...	...	...	...
Muscineæ	16	...	8	...	14	...	...	...	...	...
Musci	...	11	...	6	...	10	...	...	...	...
Hepaticæ	...	5	...	2	...	4	...	...	...	...
Characeæ	3	3	1	1	1	1	...	...	...	...
Fungi	157	...	80	...	68	...	1	...	...	...
Basidiomycetés	...	13	...	2	...	11	...	..	...	...
Uredineæ	...	1	...	1	...	1	...	...	...	...
Ascomycetes Lichenes	...	130	...	69	...	47	...	1	...	...
,, Pyrenomycetes	...	10	...	6	...	6	..	...	...	...
,, Discomycetes	...	2	...	2	...	2	...	...	...	...
Phycomycetes	...	1	...	...	...	1	...	...	...	...
Algæ	22	...	1	...	14	...	...	...	...	...
Rhodophyceæ	...	5	...	...	...	4	...	...	...	...
Phæophyceæ	...	8	...	...	...	5	...	...	...	...
Chlorophyceæ	...	9	...	1	...	5	...	...	...	...
Schizophyta	11	...	1	...	6	...	...	...	...	...
Cyanophyceæ	...	9	...	1	...	4	...	...	...	...
Schizomycetes	...	2	...	...	...	2	...	...	...	...
Diatomaceæ	25	25	...	...	14	14	...	...	...	..
	817	817	299	299	443	443	21	21	...	...

The flora of a continental island such as Socotra is in the main interesting in connection with the geographical distribution of plants and the working out of the history of their migrations over the face of the globe. But there are a number of special features in individual Socotran plants well deserving of attention, and I may briefly notice some of them.

Of plants striking as having brilliant flowers may be noted the *Adenium*, from which Aden is said to derive its name; a bulbiferous *Begonia*, which has been introduced into horticulture; a fragrant *Crinum* also in cultivation; species of *Exacum*, one of which, a lovely little annual, has been successfully grown in Europe; bright-coloured species of *Ruellia*, *Jasminum*, &c.

On morphological grounds there falls to be noticed in the first place *Dendrosicyos socotrana*, known to the inhabitants as the *camhane*, *gamhen*, or *gamha*, a new genus of Cucurbitaceæ. This plant differs from all previously known members of the family in being a tree with a stem often four or five feet in diameter at the base, rapidly tapering, and forming a very soft juicy wood, crowned at the summit with a tuft of twisted and straggling branches. Nor

is it alone in its swollen gouty stem. In *Adenium multiflorum* and *Dorstenia gigas* it finds fitting companions in its weirdness. *Cocculus Balfourii* is another plant which in habit vies with the preceding in peculiarity. In place of the twining lianes of most species of the genus, we find here an erect hard-wooded undershrub, with branches ending in spines, and bearing hard spinose cladodes. In *Punica protopunica* we have a plant which in interest surpasses most of the others in the flora,—a pomegranate with a single row of carpels, evidently representative of the stock from which the pomegranate of cultivation is sprung.

I only mention a few of these more conspicuously noteworthy plants, as they are again referred to in this introductory chapter, and fuller details regarding them are given in the descriptive part of the flora. But I must now say a word regarding plants interesting for their products, of which we have several in Socotra. And first mention may be here given to the dragon's-blood tree, *Dracæna Cinnabari*. The greater part of the dragon's-blood of commerce at the present time is the product of *Calamus Draco* of Sumatra. But the Socotran gum-resin is the old κιννάβαρι mentioned by Dioscorides. It is known on the island as *edah;* amongst the Arabs it is *kâtir*. The plant is endemic, and nearly allied to the *D. Draco* of Teneriffe. From the other gum-resin-producing species, *D. Ombet* of Abyssinia and *D. schizantha* of Somali-land, of which we have as yet but imperfect knowledge, it is apparently quite distinct. The gum-resin exudes in tears from the stem of the tree, and is collected after the rains, the gatherer chipping off the tears into goat-skins. There are three forms in which the gum-resin is exported. Of these *edah amsello*—the tears as they exude from the tree—is the purest and most valuable form; 2½ lbs. fetch one dollar. The second best kind is called *edah dukkah*. It consists of the small chips and fragments of the tears which have been broken off in separating the gum-tears from the tree, or by attrition; it sells at one dollar for 4 lbs. The cheapest is the *edah mukdehah*, which brings a dollar for 5 lbs., and is very impure. It is in the form of small flat-sided masses, and consists of fragments of gum-resin and refuse of the gatherings melted together into a flat cake, and then broken up into smaller portions.

Of other gum-resin-producing trees on the island, the frankincense and myrrh-trees must be noticed. I have already referred to the discussion that has taken place regarding the incense-country of the ancients. The Hadramaut country is the chief incense-region, and to its kings Socotra is said to have been subject. But Socotra, as I have already mentioned, is identified on ethnological grounds by Mariette as the 'To Nuter' of the Theban monuments; and we find the genus *Boswellia*, which yields frankincense, represented in Socotra by no less than three species, all of which are endemic, and possibly there is a fourth; as there are only three other known species of the genus, all of which save one are Somali-land plants, the proportion

occurring in Socotra is very large. The commonest frankincense in the island is the *ameero,* but it is not much exported.

Of myrrh-plants Socotra possesses no less a share. Besides the *Balsamodendron Mukul* which yields the Indian 'bdellium'—the *googul* or *mukul* of the Arabians,—there are probably five other species of the genus on the island. Possibly one of these is the Arabian *B. opobalsamum,* the true myrrh-plant. The myrrh collected is termed *leggehen,* and is said to be exported.

So far then as the occurrence of frankincense and myrrh-producing trees is evidence, Socotra may well be the To Nuter of Theban monuments; for no area known to us of equal extent has so many peculiar forms.

The most important plant of the island, so far as products are concerned, is the *Aloe Perryi,* which yields the 'Socotrine aloes'* of commerce. The gum is known as *tâyef* by the natives; the Arabs call it *sobr.* Although this kind of aloes has been so long known, and has the reputation of being finer than either Barbadoes or Cape aloes, it is only within the past few years that the character of the plant has been made known. It grows abundantly on the island, especially on the limestone plateaux. The collection of the gum is a very simple process, and can be accomplished at any season. The collector scrapes a slight hollow on the surface of the ground in the vicinity of an aloe-plant, into which he depresses the centre of a small portion of goat-skin spread over the ground. The leaves of the aloe are then cut and laid in a circle on the skin, with the cut ends projecting over the central hollow. Two or three layers are arranged. The juice, which is of a pale amber colour, with a slightly mawkish odour and taste, trickles from the leaves upon the goat-skin. After about three hours the leaves are exhausted; the skin containing the juice is then removed from beneath them, and the juice is transferred to a mussock. Only the older leaves are used. The juice thus collected is of a thin watery character, and is known as *tâyef rhiho,* or watery aloes. In this condition it is exported to Muscat and Arabia, and sells for three dollars the skin of 30 lbs. By keeping, however, the aloes changes in character. After a month the juice, by loss of water, becomes denser and more viscid; it is then known as *tâyef gesheeshah,* and is more valuable—a skin of 30 lbs. fetching five dollars; whilst in about fifteen days more—that is, about six weeks after collection—it gets into a tolerably hard solid mass, and is then *tâyef kasahul,* and is worth seven dollars a skin of 30 lbs. In this last condition it is commonly exported.

There is, as I have said, no forest on the island, and yet there is one small tree, or large shrub, which may be of some value commercially. It is the *metayne,* a kind of box-tree, *Buxus Hildebrandti.* It was first found by Hildebrandt on the Somali-land hills. It forms a hard, compact wood, and, I doubt not, might be used for many of the purposes for which boxwood is so

* For explanations of this term see Appendix, note under page 292.

valuable at the present time. It is abundant on the island, and Hildebrandt reported it very common in Somali-land. I did not bring home sufficient specimens to allow of an experimental trial of this as a material for wood-cuts or other purposes. I learn from Dr Schweinfurth, that he has sent some to Berlin to be tried in this way.

Many plants are used on the island for the purposes of dyeing—*Gaillonia tinctoria, Taverniera sericophylla, Indigofera tinctoria, Roccella tinctoria.* The last-named occurs in abundance, and was formerly exported in great quantity. It is known as *shennah.*

Surveying the flora from the point of view of its relations and development, we shall consider the Phanerogams in the first instance;—and I must state that in making any statistical estimates of the relations of the flora the numbers must be regarded as approximative only. I have already mentioned that the species brought home by the English and German expeditions are but a small part of those that exist in the island. The collections give a fairly representative sample of the flora, and of the more generally distributed plants they contain, I think, a large proportion; but of the vegetation in the many rocky ravines at high altitudes which sculpture the central granitic region of the island, that from which several of the most interesting of our plants were obtained, we have a comparatively fragmentary gathering. Besides, it has to be remembered that we know comparatively little of the flora of the adjacent mainlands, and that future exploration of these will doubtless necessitate changes in the estimate it is now possible to make. Already an illustration of this is afforded, for since the descriptive part of this flora was printed, the list of plants collected by Mr H. H. Johnston on Kilima Njaro and adjacent parts of tropical Africa has been published, and his discoveries modify in a slight degree the distribution of some of the Socotran forms. Reference to these will be found in the Appendix.

In the phanerogamic flora the 565 species belong to 314 genera, and are included in 81 orders—giving thus about 7 species to each order and 4 to each genus. Monocotyledones comprise 100 of the total species, or 17·61 per cent.; the ratio of Monocotyledones to Dicotyledones being therefore as 1 to 4·6. This proportion is about the same as in the Indian Ocean islands. It is largely determined by the number of Gramineæ and Cyperaceæ, which together comprise nearly two-thirds of the Monocotyledones, but the number of Monocotyledones belonging to other groups will, I am confident, be largely increased by future exploration. Both the English and the German expeditions were on the island at the time when few bulbous monocotyledonous plants are in flower, and consequently the occurrence of many species of these is not yet recorded. The gamopetalous species of dicotyledonous plants only exceed the polypetalous by 24 species, which is a small excess for such a flora.

The ordinal composition of the phanerogamic flora may be grasped from the subjoined table:—

TABLE SHOWING THE ORDINAL COMPOSITION OF THE PHANEROGAMIC FLORA OF SOCOTRA.

Orders.	Total Genera.	Total Species.	Endemic Genera.	Endemic Species.	Genera of Endemic Species only.	Orders of Endemic Species only.	
Acanthaceæ,	15	27	3	21	9	...	
Amarantaceæ,	6	10	...	2	...	...	
Amaryllideæ,	2	2	...	2	2	×	
Ampelideæ,	1	3	...	2	...	...	
Anacardiaceæ,	2	4	...	3	1	...	
Apocynaceæ,	3	3	1	1	1	...	
Aristolochiaceæ,	1	1	...	?	...	?	Probably the species is endemic, but cannot be determined.
Asclepiadeæ,	12	18	2	8	7	...	
Begoniaceæ,	1	1	...	1	1	×	
Bixineæ,	1	1	...	...	...	...	
Borragineæ,	5	18	1	9	2	...	
Burseraceæ,	2	11	...	6	1	...	
Campanulaceæ,	2	2	...	...	...	...	
Capparideæ,	5	11	...	1	...	...	
Caryophylleæ,	4	7	...	2	...	...	
Chenopodiaceæ,	3	3	...	...	...	...	
Compositæ,	24	39	...	22	9	...	
Commelinaceæ,	2	4	...	...	...	...	
Convolvulaceæ,	8	19	...	7	1	...	
Crassulaceæ,	2	5	...	3	...	...	
Cruciferæ,	5	7	1	3	2	...	
Cucurbitaceæ,	6	9	1	2	2	...	
Cyperaceæ,	6	23	...	...	...	...	
Dioscoreaceæ,	1	1	...	1	1	×	
Ebenaceæ,	1	5	...	2	...	...	
Euphorbiaceæ,	11	27	...	16	5	...	
Ficoideæ,	5	5	...	1	1	...	
Gentianeæ,	2	4	...	3	1	...	
Geraniaceæ,	3	3	1	1	1	...	
Gramineæ,	28	51	1	5	4	...	
Hydrocharideæ,	1	1	...	...	...	...	
Hypericineæ,	1	4	...	2	...	...	
Illecebraceæ,	2	2	2	2	2	×	
Irideæ,	2	2	...	1	1	...	The non-endemic species is represented by an endemic variety.
Juncaceæ,	1	1	...	...	...	...	
Labiatæ,	7	14	...	7	3	...	
Leguminosæ,	25	53	1	16	7	...	
Liliaceæ,	7	8	...	6	5	...	
Lineæ,	1	1	...	...	...	...	
Loranthaceæ,	1	1	...	?	...	?	Probably the species is endemic, but cannot be determined.
Lythrarieæ,	3	4	...	1	1	...	
Malpighiaceæ,	1	1	...	...	...	...	
Malvaceæ,	5	17	...	3	...	...	
Menispermaceæ,	1	2	...	1	...	...	
Myrsineæ,	1	1	...	...	...	...	
Naiadaceæ,	3	6	...	...	...	...	
Nyctagineæ,	1	3	...	...	...	...	
Oleaceæ,	1	1	...	1	1	×	
Onagrarieæ,	1	1	...	...	...	...	
Orchideæ,	1	1	...	1	1	×	
Orobanchaceæ,	2	5	...	...	...	...	
Papaveraceæ,	1	1	...	...	...	...	
Pedalineæ,	1	1	...	...	...	...	
Piperaceæ,	1	3	...	...	...	...	
Plantagineæ,	1	1	...	...	...	...	
Plumbagineæ,	2	4	...	1	...	...	One of the species is represented by an endemic variety.
Polygalaceæ,	1	3	...	...	...	...	
Polygonaceæ,	1	2	...	...	...	...	

TABLE SHOWING THE ORDINAL COMPOSITION OF THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

ORDERS.	Total Genera.	Total Species.	Endemic Genera.	Endemic Species.	Genera of Endemic Species only.	Orders of Endemic Species only.	
Portulaceæ,	2	3	...	...	...	...	
Primulaceæ,	1	1	...	...	...	...	
Resedaceæ,	2	2	...	1	1	...	
Rhamneæ,	1	2	...	...	...	...	
Rubiaceæ,	9	18	1	11	4	...	
Rutaceæ,	1	1	...	1	1	×	
Salvadoraceæ,	1	1	...	...	...	...	
Santalaceæ,	2	3	...	1	...	...	
Sapindaceæ,	2	3	...	1	1	...	
Sapotaceæ,	1	1	...	1	1	×	
Scrophularineæ,	12	13	1	4	4	...	
Selagineæ,	1	1	1	1	1	×	
Solanaceæ,	5	8	...	1	...	...	
Sterculiaceæ,	2	2	...	1	1	...	
Tamariscineæ,	1	1	...	...	...	...	
Thymelæaceæ,	1	1	...	1	1	×	
Tiliaceæ,	3	9	...	4	1	...	
Umbelliferæ,	4	5	1	4	3	...	
Urticaceæ,	5	7	...	2	2	...	
Valerianeæ,	1	1	...	1	1	×	
Verbenaceæ,	5	6	1	3	2	...	
Violarieæ,	3	3	...	1	1	...	
Zygophylleæ,	3	4	...	...	...	...	One species has an endemic variety.
Genus Anomalum,	1	1	1	1	1	...	
	314	565	20	206	98	11	

That Leguminosæ should be the most numerously represented family is not surprising, and it owes the position to the large number of species of such genera as *Indigofera*, which has nine species, *Tephrosia*, with six species, *Crotalaria* and *Cassia*, each with five species. A large number of the species —sixteen, or nearly one-third—are widely-spread weeds, many of which have doubtless been introduced, but there is an equal proportion of the species endemic; and there is one endemic genus. There are some interesting points to notice in the plants of the order. Thus, *Priotropis socotrana* is an endemic species of a genus hitherto known in one species, *P. cytisoides*, Wight and Arn., a plant of the eastern Himalayas. *Cylista scariosa*, a member of a monotypic genus, has the remarkable distribution of 'Indian Peninsula and Mauritius.' The two species of *Lotus*, *L. ononopsis* and *L. mollis*, constitute along with *L. Garcini*, a plant of Nile-land, Persia, and Scindh, a section of the genus *Lotus* of quite exceptional character, and approaching *Ononis*. *Arthrocarpum*, the endemic genus, of the tribe Hedysareæ, has close affinities with a group of American genera. *Dichrostachys dehiscens* violates the character of the genus in which it is included, and resembles closely some typical American genera.

Gramineæ is almost as abundantly represented as Leguminosæ, and three-fifths of the species are widely-spread plants in tropical regions. It is noteworthy, however, that a new Hordean genus *Ischnurus* occurs, having affinity with the Indian *Oropetium;* and another interesting plant is *Rhynchelytrum microstachyum,* belonging to a little-known genus hitherto found in two species, one inhabiting Abyssinia, and one Æthiopia. There are in addition three endemic species of such widely-spread genera as *Eriochloa, Panicum,* and *Lepturus.*

In Compositæ we have an order represented by species more than half of which are endemic, and not quite one-seventh are weeds of cosmopolitan tropical growth. Of the shrubby character which Compositæ of insular floras so frequently exhibit we have illustrations in Socotra. *Vernonia Cockburniana* is the largest species, forming at times a small tree; as small shrubs, or rather undershrubs, we have *Psiadia Schweinfurthii, Pluchea aromatica, Pluchea obovata, Pulicaria stephanocarpa, Pulicaria vierœoides,* and *Euryops socotranus.* Of the distribution of the genera of these shrubs, it is noteworthy that *Psiadia* is essentially a genus of tropical Africa, Madagascar, and the Mascarene islands—but one African species extends into Arabia, and with this Arabian form our Socotran plant has close affinity; and that *Euryops* is primarily a south African genus, with, however, a representative in Nile-land and one in Arabia (probably the same form in these localities). *Pulicaria* is a genus with maximum development in the Mediterranean region, but with outlying forms in south Africa and western Asia; but I may note that the two Socotran undershrubs referred to here are included in this genus with some reserve, and may probably eventually be excluded from it. *Vernonia* is a general tropical genus with a Brazilian centre of greatest development. Upon the island these shrubby forms are, with the exception of the *Vernonia* and *Pulicaria stephanocarpa,* inhabitants of the higher lands in the central granitic region; *Vernonia,* on the other hand, is widely distributed over the island; and it is to be remarked that when the plant grows upon the dry unfavourable limestone plains of the higher regions, it does not assume an arboreous character, but forms a low, stunted, gnarled, and twisted shrub. *Pulicaria stephanocarpa* is the commonest undershrub on the plain about Gallonsir. The great development of *Helichrysum* is a characteristic feature in the flora; no less than seven species, and all endemic, are known. They are natives of the highest peaks, and such as *H. rosulatum, H. aciculare, H. suffruticosum,* and *H. Nimmoanum* have the character of small undershrubs. *Senecio Scotti,* belonging to the Kleinia section of the genus, which is almost exclusively south African, is another interesting Composite. Its errant position finds a correspondence in that of *Senecio longiflorus* on the Abyssinian highlands. *Dichrocephala chrysanthemifolia* was only gathered on the top of the Haghier peaks, and is the plant found at the highest altitude.

Euphorbiaceæ, with about one-twentieth of the species of the flora, is not so well represented generically as the order just mentioned; ten of the species—seven being endemic—belong to *Euphorbia* itself. Four-sevenths of the whole species are endemic. The most noteworthy feature in this family on Socotra, is the occurrence of the fleshy leafless tree-euphorbia, *E. arbuscula*, which to some extent may be said to mimic the dragon's-blood tree, *D. Cinnabari*. It has a near ally in *E. aphylla* of the Canary Islands, along with which occurs, it is interesting to observe, the dragon's-blood tree of these islands, *D. Draco*. *Euphorbia spiralis* is another fleshy, leafless, and spiny form, with south African and Atlantic Island representatives. The presence of Hildebrandt's Somali-land box-tree, *Buxus Hildebrandti*, must not be passed over, nor the fact that there are four endemic species of *Croton*, and an endemic representative of *Cephalocroton*, a genus hitherto known in two species—one from Mozambique and one from Nile-land.

Acanthaceæ is, in some ways, the order with the most remarkable development in Socotra. It comprises twenty-seven species, i.e., it forms nearly one-twenty-first part of the flora, and of these species all but six, or seven-ninths of the whole order, are endemic. Thus one-tenth of the endemic plants is acanthaceous. The twenty-seven species are included in fifteen genera, and of these three are endemic, and seven more are represented only by endemic species—one of them being tritypic and the other ditypic—so that over one-seventh of the endemic genera is acanthaceous. In this family are some of the prettiest flowering shrubs, such, for instance, as *Ruellia insignis*, *Ruellia carnea*, *Barleria aculeata*, and the species of *Ballochia*. The endemic genera *Ballochia*, *Trichocalyx*, *Ancalanthus*, have allies in genera of the adjacent continents. But in addition to this element of endemic genera, it is noteworthy that several of the endemic species referred to other genera show divergence from the characters ascribed to these. Thus *Blepharis spiculifolia* has several floral characters modifying those described for *Blepharis*, and similarly the generic character of *Barleria* is affected by *Barleria tetracantha* and *Barleria argentea*, which have only one ovule in each cell of the ovary, quite an exceptional character in the order. *Neuracanthus aculeatus* and *N. capitatus* also differ in habit from the rest of the genus, and the hygroscopic inflorescences of the latter are peculiar. *Justicia heterocarpa* is noteworthy on account of its diversely formed fruits and seeds. *Anisotes diversifolius* is an endemic representative of a genus known only by a single species in Arabia, and, since the description of the plant was written, by another from east tropical Africa, collected by Mr H. H. Johnston. *Ecbolium striatum* is also an endemic species of a genus elsewhere represented by one variable and widely-spread species.

There is not much noteworthy in Cyperaceæ as it forms part of the Socotran flora. Thirteen of the species belong to *Cyperus*, and *Fimbristylis*

is responsible for other five. Most of the species, thirteen, are cosmopolitan tropical plants, and seven are widely spread in the tropics of the old world. One species, *Cyperus proteinolepis*, is primarily an Arabian species, but a variety of it, which also occurs on Socotra, extends to upper Egypt; and there is an endemic variety of *Cyperus conglomeratus*, a species with a geographical area extending from north-east Africa through Arabia to Beloochistan and Affghanistan.

In Convolvulaceæ, forming more than three per cent. of the flora, there are seven endemic species, and of these the most interesting are the plants I have described as species of *Breweria*. Neither *B. fastigiata* nor *B. glomerata* adjust themselves to the generic character, but appear, especially the former, to share the features of more than one allied genus; and a like remark applies to *Porana obtusa*, which I have included in what is a very polymorphous and at present unsatisfactorily-defined genus.

Rubiaceæ, Asclepiadeæ, and Borragineæ constitute each one-thirty-first part of the flora, and are deserving of special mention.

Rubiaceæ is only about half as extensively represented as *Compositæ*, which is noteworthy on account of the inverse relation prevailing in tropical Africa and the Mascarene Islands. More than half of the species are endemic, and there is one endemic genus. The most remarkable feature in the family is the great development of the genus *Dirichletia*, hitherto known in four species from tropical Africa, Madagascar, and Somali-land. The Somali-land plant occurs on Socotra and also three endemic species—one, *D. obovata*, being quite one of the commonest trees upon the shore-plains and hill-slopes. As might have been expected, the Socotran plants necessitate considerable emendation in the described generic character. *Placopoda*, the endemic genus, is a near alley of *Dirichletia*. Of other plants in the order, the endemic *Mussænda capsulifera* may be noticed on account of its capsular dehiscing fruit, in which feature it resembles the Nile-land *M. luteola*, already recorded as an aberrant form in the genus.

Asclepiadeæ is another order with a remarkable development in Socotra. Our material does not allow of specific determination of five distinct plants belonging to the order, and the species of another is doubtful; but of the twelve we have named eight are endemic, and two of them form monotypic endemic genera. The endemic genera *Mitolepis* and *Cochlanthus* belong to *Periplocæ*, and have affinity with African genera. I have only described two endemic genera from the island, but it is not without violence to generic characters, as defined by Hooker and Bentham, that other species are placed in the genera to which they are assigned. Thus *Secamone socotrana* diverges from its generic type in the internal villous appendages to the corolla, and, like the Mascarene and Madagascar members of the genus, has sinistrorse æstivation.

and compact inflorescence. Both species of *Ectadiopsis* differ from the type of the genus in the form and relation of the corona-scales, and *E. volubilis* is unique on account of its twining habit. *Vincetoxicum linifolium*, another endemic species, has flagelliform twining branches and narrow linear leaves, features only observable in some West Indian species of the genus. The distribution of *Sarcostemma Daltoni* deserves notice. It is known with certainty elsewhere only in the Cape de Verde Islands, and the Socotran plant differs in trifling details alone from the form in these islands; but it is likely that it ranges over the highlands of tropical Africa, some fragmentary specimens from these regions having the facies of the species, though identification is not possible. We have only been able to identify for certain one out of four *Stapelieæ* from the island, which proves to be endemic. A second is probably the monotypic Abyssinian *Echidnopsis*. There are in our collection, besides the named forms and those referred to genera but not specifically known, portions of several asclepiadaceous species, and future explorers of the island will be able to increase greatly the number of known plants of the family.

The Socotran Borragineæ are chiefly remarkable because they comprise an endemic genus, *Cystistemon*, which has beautiful azure-blue flowers, and is well worthy of cultivation. Its affinity in the family is somewhat doubtful. *Trichodesma Scotti*, another of the endemic species—which are nine in all, or one-half the order,—has this to mark it,—its flowers are the largest of any in the genus. *Heliotropium*, as might be expected, includes a large portion, one half, of the species of the order, most of them being scabrid plants of the plains. *Cordia obovata* may have mention, because its succulent fruit is one of the few edible fruits on the island,—very poor as a fruit it is.

In the Labiatæ, of which nearly half the species are endemic, there is nothing requiring special mention except, perhaps, the occurrence of two species of *Lasiocarys*, a genus represented elsewhere in two south African and one Abyssinian species, and the remarkable mimicry between the foliage of *Lasiocarys spiculifolia* and the acanthaceous *Blepharis spiculifolia*.

Scrophularineæ in Socotra exhibits many features of interest. Its thirteen species are distributed in twelve genera, *Striga* being the only genus with more than one species; one-third of the representatives are endemic, and one constitutes an endemic genus. Seven of the species are indigenous annuals, and one of them is endemic. The endemic genus *Xylocalyx* is very peculiar on account of the increase in size, hardening, and lignification of the calyx after flowering; its alliances are chiefly tropical African. *Graderia fruticosa* is an endemic member of a genus hitherto described as monotypic south African, but I have seen specimens of an undescribed Angola species. The endemic *Campylanthus spinosus* is another interesting geographical species. Only four other species of the genus are known, two being from Cape de Verde Islands, a third known

at Aden and reaching Scindh, and the fourth occurs in Scindh and Beloochistan. *Camptoloma villosa* is an endemic annual, and its occurrence in Socotra has great value, from a geographical point of view, as the only other species of the genus, *C. rotundifolia*, is found at Elephant Bay, in south Africa. That *Schweinfurthia pedicellata* is only known elsewhere at Aden, and that *Linaria hastata* is entirely Abyssinian, are facts of distribution which swell the number of noteworthy points in this family.

Capparideæ and Burseraceæ have an equally strong muster in Socotra. All the Burseraceæ belong to the genera *Boswellia* and *Balsamodendron*. Of the eleven species recorded, two of *Boswellia* and two of *Balsamodendron* are unfortunately too imperfectly represented in our collection to admit of determination, and of the others, three are endemic species of *Boswellia*, and a like number are claimed by *Balsamodendron*. This, especially in the case of *Boswellia*, is a remarkable development, and well entitles Socotra to be ranked as a portion of the incense-country of the East. It is quite probable that the peculiar character of the incense-trees of Socotra may be to some extent lessened by the discovery of the species on the adjacent mainland of Africa and Asia.

Amarantaceæ, the next most numerously represented order, I only mention to bring out the fact that one of the Socotran endemic species, *Aerua microphylla*, was described so long ago as 1849, by Moquin-Tandon, in De Candolle's Prodromus, from "shores of the Red Sea," as it was in the collection sent by Mr Nimmo to Sir William Hooker (see Preface, page xvi).

Tiliaceæ and Cucurbitaceæ, with nine species each, demand attention to some of their features. The heterophylly in foliage-leaves, which is so marked a feature in the Mascarene flora, is not conspicuous in that of Socotra, but in the endemic tiliaceous *Grewia bilocularis* adventitious twigs have small cordate-deltoid hairy leaves with purple margins, quite different from the usual adult form of leaf, and the plant is therefore heterophyllous. *Corchorus erodioides* is another endemic tiliaceous species, which may be noted in passing for its difference in habit from the generic type, for a slightly diverse form of its leaves, and the recurving of the peduncles after flowering and consequent burying of the fruit. Cucurbitaceæ possesses one of the most striking plants in the flora. It is the tree-cucurbit with thickly gouty stems, which I have named *Dendrosicyos socotrana*, the camhane, gamhen, or gamha of the inhabitants. It is quite a unique plant in the family. We have not, unfortunately, material for a full analysis of the plant, and fruit and seeds are still unknown. The occurrence of an endemic species of *Eureiandra* is another fact which gives interest to this order, for only two other species are known—one from Angola and one from central Africa.

Of Solanaceæ and Liliaceæ, which have an equal number of species, eight, in Socotra, I need only notice the latter here. I have previously mentioned reasons for the small number of petaloid monocotyledonous plants we have from Socotra,

and amongst Liliaceæ there are only two bulbous forms, both new, one brought by the English and one by the German expedition. Of the eight species of Liliaceæ known, six are endemic, and one of the other species is represented by an endemic variety. By far the most interest attaches in this family to the existence of *Aloe Perryi*, the source of the Socotran aloes, and to *Dracæna Cinnabari*, the Socotran dragon's-blood tree. Both are endemic plants. The alliance of the Socotran *Dracæna* with the Canary Island tree, with that of Abyssinia and with one recently found in Somali-land, is a fact of leading importance in geographical distribution.

Cruciferæ, Caryophylleæ, and Urticaceæ come next in numerical importance. Cruciferæ is chiefly remarkable for an endemic genus, *Lachnocapsa*, the affinity of which it is difficult to determine. In Urticaceæ we have another of the remarkable plants of the flora, namely, *Dorstena gigas*, which is a low-growing plant, which possesses a thick gouty stem, from which a yellow viscid juice exudes. The occurrence of the south African *Australina capensis* is a curious fact of distribution in this family.

Verbenaceæ, which, like Naiadaceæ, has six species, half of them being endemic, has an endemic genus *Cœlocarpus*, the affinity of which arrests attention. The closest relationship appears to be to *Citharexylum*, a tropical and subtropical American genus, spreading from Brazil and Bolivia to Mexico, and so close is the affinity that it is only in the androecium technical characters of separation are found.

Of Crassulaceæ, Ficoideæ, Umbelliferæ, Ebenaceæ, and Orobanchaceæ, each with five species, Umbelliferæ alone calls for mention here, and that because of its containing an endemic genus, *Nirarathamnos*, belonging to the affinity of *Bupleurum*. It is an elegant woody undershrub, growing only on the higher peaks of the central granitic region of the island.

Of seven orders which have each four representatives,—Hypericineæ, Zygophylleæ, Anacardiaceæ, Lythrarieæ, Plumbagineæ, Gentianeæ, and Commelinaceæ,—Anacardiaceæ and Gentianeæ have each three endemic species. In the first of these two orders, one of the endemic species, *Rhus thyrsiflora*, which is amongst the commonest tree on the island, has affinity amounting almost to identity with *R. paniculata*, a plant only known from Birma and Yunan; and the two others are species of *Odina*, one of which, *O. asplenifolia*, yields a false frankincense like the nearly related *O. obovata* of Somali-land, the other being the ukshare, uksha, or eksche of the inhabitants, one of the largest trees of the island. In Gentianeæ there are three very pretty endemic species of *Exacum*, one of which, *E. affine*, has been introduced to cultivation in this country; *E. cæruleum*, from the higher parts of the central granitic region, is however the prettiest species. Lythrarieæ has only one endemic species, but that one possesses as much interest as any plant in the flora. *Punica protopunica*,

as its designation implies, may be regarded as representing the primitive stock of the pomegranate. The gynæceum consists of but a single whorl of carpels, the placenta being spread out over the floor of each carpel, and there is never any sign of the second whorl of the cultivated form.

Geraniaceæ, with three species on the island, presents us with an endemic genus, *Dirachma*, which is, as regards its affinities, somewhat puzzling. Tiliaceæ, Sterculiaceæ, and Samydaceæ may all in some degree claim the genus, but the preponderance of characters seems to place it in Geraniaceæ, and there its relationships appear to be with monotypic south American genera, and thus it is one of the forms from the Indian Ocean whose affinities are antipodean. Apocynaceæ is another three-membered order which has features of interest. One species is endemic, and constitutes a new genus *Socotora*, which in all its characters shows strong individuality, and is a very exceptional one. Another species is *Adenium multiflorum*, one of the gouty plants from the island, and only known elsewhere in Mozambique. Santalaceæ, which also has three species, may be mentioned here that I may point out the curious dimorphism in the staminate flowers of the endemic *Osyris pendula*, and that the *Thesidium* is probably an endemic species, but is indeterminable from our specimens.

Of nine orders which have two species in Socotra I will mention here Menispermaceæ, noteworthy on account of the cladodiferous and spinose *Cocculus Balfourii*; Illecebraceæ, represented by two species, each the type of an endemic genus,—*Haya* allied to *Illecebrum*, and *Lochia* having affinity with *Gymnocarpos*; Irideæ, which has an endemic species of the south African genus *Babiana*, now in cultivation at Kew, and an endemic variety of *Romulea purpurascens*, the bulbs of which are said to be eaten in Socotra, and which it is recorded Wellsted brought from Socotra; and Amaryllideæ, with a handsome and fragrant endemic *Crinum*, now in cultivation in Britain, and an endemic *Hæmanthus*, of which the very large leaves only are known. It will be observed that Illecebraceæ and Amaryllideæ are represented by endemic species alone, and that Irideæ has one endemic species, and an endemic variety of its second representative.

Twenty families have only one representative in Socotra, and in the case of nine the species is endemic, and one constitutes an endemic genus. Amongst these, Rutaceæ is remarkable, for its representative *Thamnosma socotrana* belongs to a genus which has only two other species, both of which are north American. Begoniaceæ deserves mention on account of the beauty of its member *Begonia socotrana*, a plant now in cultivation in Europe, and peculiar in its bulbiferous character and orbicular leaves. *Valerianella affinis* of the Valerianaceæ is an endemic annual. The selagineous plant constitutes an endemic genus *Cockburnia*, nearly allied to *Globularia*, a genus of the Mediterranean region, central Europe, and the Canary Islands. *Lasiosiphon socotranus*, the endemic and only

representative of Thymelæaceæ, differs conspicuously from the generic character in the want of perianth-scales, a feature in which it resembles an undescribed east African species collected by Hildebrandt. Orchideæ has as its only species the endemic *Habenaria socotrana,* with an affinity in *H. attenuata,* a plant of the Cameroons. The single species of Aristolochiaceæ and of Loranthaceæ is in each case probably endemic, but our specimens are not sufficient to admit of determination. *Acridocarpus orientalis,* the only representative of Malpighiaceæ, although not endemic, is worthy of note, because it is elsewhere only known from the vicinity of Muscat.

I must not omit to note here, at the conclusion of this brief survey of orders, the remarkable plant *Wellstedia socotrana.* It is placed in the system as an anomalous genus belonging to Bicarpellate Gamopetalæ, but the order in which it should find a position is difficult to fix. Mr Bentham would place it in Verbenaceæ, but it has many resemblances with Boragineæ. This question is discussed under the description of the plant.

The endemic flora consists of 206 species—17 being annuals—which fall into 136 genera, of which 20 are themselves endemic; otherwise expressed this is :—36·5 per cent., or more than one-third of the total species, are endemic, and 6·3 per cent., or just about one-fifteenth of the total genera, are endemic. This is a large proportion of endemic species, much greater than that in the Seychelles and Mascarene Islands, and about the same as in Madagascar, but the proportion of endemic genera is much less than in the latter island. In speaking of the orders, I have already referred to the more striking of the endemic species, and now I give the following list of them, adding a few remarks upon affinities or other noteworthy points :—

List of endemic species in the phanerogamic flora of Socotra.

	Remarks, Affinities, &c.
Menispermaceæ.	
Cocculus Balfourii, *Schweinf.*, . . .	Remarkable for its cladodiferous shrubby habit.
Cruciferæ.	
Farsetia prostrata, *Balf. fil.*	
Brassica rostrata, *Balf. fil.*, . . .	Annual. Allied to *Brassica Tournefortii*, Gouan. and *B. fruticulosa*, Cyr., Mediterranean and Oriental species. Has also an endemic hirsute variety.
* *Lachnocapsa spathulata*, Balf. fil., . .	An endemic genus of doubtful affinity.
Capparideæ.	
Cleome socotrana, *Balf. fil.*, . . .	Annual. Allied to *Cleome arabica*, Linn., a north African and Arabian species.
Resedaceæ.	
Reseda viridis, *Balf. fil.*, ...	Allied to *Reseda Aucheri*, Boiss., a plant of Mesopotamia, Persia, and Scindh.
Violarieæ.	
Alsodeia socotrana, *Balf. fil.*	

* Species of endemic genera are printed in italics.

LIST OF ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

	Remarks, Affinities, &c.
CARYOPHYLLEÆ.	
Polycarpæa divaricata, *Balf. fil.*, . .	Annual.
,, cæspitosa, *Balf. fil.*	
HYPERICINEÆ.	
10 Hypericum scopulorum, *Balf. fil.*, . .	Has nearest allies in *H. nanum*, Poir. and *H. cardiophyllum*, Boiss. from the Levant.
,, tortuosum, *Balf. fil.*	
MALVACEÆ.	
Hibiscus Scotti, *Balf. fil.*, . . .	Allied to the Mozambique *H. Kirkii*, Mart. and the tropical African *H. panduriformis*, Burm.
,, stenanthus, *Balf. fil.*	
,, malacophyllus, *Balf. fil.*, . .	Remote affinity with *H. gossypium*, Thunb. of east and south tropical Africa.
STERCULIACEÆ.	
Melhania muricata, *Balf. fil.*, . . .	Very near the Arabian and Scindh *M. Denhami*, R. Br.
TILIACEÆ.	
Grewia turbinata, *Balf. fil.*	
,, bilocularis, *Balf. fil.*, . . .	Heterophyllous. Allied to *G. bracteata*, Roth., a plant of the Carnatic and Ceylon.
Corchorus erodioides, *Balf. fil.*, . .	Differs in habit from type of genus. Its nearest allies are *C. asplenifolius*, Burch. and *C. serræfolius*, Burch., both south African.
Elæocarpus transultus, *Balf. fil.*, . .	Connects the Madagascar and Mascarene forms with the Indian. The genus is absent from Africa.
GERANIACEÆ.	
20 *Dirachma socotrana*, Schweinf., . .	Endemic genus, with strong south American affinity.
RUTACEÆ.	
Thamnosma socotrana, *Balf. fil.*, . .	Representative of an American genus which has only two other species.
BURSERACEÆ.	
Boswellia Ameero, *Balf. fil.*, . . .	Allied to the Abyssinian *B. papyrifera*, Ach. Rich. and the Somaliland *B. Carterii*, Birdw.
,, elongata, *Balf. fil.*, . . .	Near *B. Carterii*, Birdw. and some forms of the Indian *B. serrata*, Roxb.
,, socotrana, *Balf. fil.*	
Balsamodendron socotranum, *Balf. fil.*, .	Allied to *B. opobalsamum*, Kth. from Arabia, Nubia, and Somaliland.
,, parvifolium, *Balf. fil.*, .	Allied to *B. pubescens*, Stocks, a Scindh plant.
,, planifrons, *Schweinf.*	
AMPELIDEÆ.	
Vitis subaphylla, *Balf. fil.*	
,, paniculata, *Balf. fil.*, . . .	Allied to the south African *V. tetragona*, Harvey.
SAPINDACEÆ.	
30 Allophylus rhoidiphyllus, *Balf. fil.*	
ANACARDIACEÆ.	
Rhus thyrsiflora, *Balf. fil.*, . . .	Almost conspecific with the Birmese *R. paniculata*, Wall.
Odina ornifolia, *Balf. fil.*, . . .	Its nearest allies are the upper Guinea species *O. velutina*, Balf. fil. and *O. Barteri*, Oliv.
,, asplenifolia, *Balf. fil.*, . . .	Allied to the Somali-land *O. obovata*, Hook. fil.
LEGUMINOSÆ.	
Crotalaria strigulosa, *Balf. fil.*, . .	Nearest affinity is *C. triquetra*, Dalzell and other species from the Indian Peninsula and Ceylon.
,, leptocarpa, *Balf. fil.*	
,, pteropoda, *Balf. fil.*, . .	Annual.

LIST OF ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

	Remarks, Affinities, &c.
LEGUMINOSÆ—*continued.*	
Priotropis socotrana, *Balf. fil.*,	Only one other species is known in this genus, *P. cytisoides*, Wight and Arn., a plant of the tropical eastern Himalayas.
Trigonella falcata, *Balf. fil.*,	Annual. Next to *T. hamosa*, Linn., a plant of Nile-land, Egypt, and south Africa.
Lotus ononopis, *Balf. fil.*,	Both allied to *L. Garcini*, DC., a plant of Nile-land, Persia, and Scindh. Those three species diverge so much from the generic character as to form a distinct subgenus *Ononidium*.
40 ,, mollis, *Balf. fil.*,	
Indigofera nephrocarpa, *Balf. fil.*	
,, marmorata, *Balf. fil.*	
Tephrosia odorata, *Balf. fil.*,	The solitary axillary flowers are unusual in the section *Brissonia*, to which it belongs.
Taverniera sericophylla, *Balf. fil.*,	A trifoliolate species allied to *T. lappacea*, DC. from Nubia, and *T. Stocksii*, Boiss. and *T. spartea*, DC. from Beloochistan and Persia respectively.
Ormocarpum cæruleum, *Balf. fil.*,	Probably nearest *O. Kirkii*, S. Moore, an east tropical African species reaching Somali-land.
Arthrocarpum gracile, Balf. fil.,	One of the Hedysareæ; its generic alliance is with *Ormocarpum* and some south American genera.
Dichrostachys dehiscens, *Balf. fil.*,	Differs in important points from the generic character.
Acacia socotrana, *Balf. fil.*,	Has affinity with *A. abyssinica*, Hochst. of Abyssinia and *A. nubica*, Benth., a plant of Nubia and Arabia.
,, pennivenia, *Balf. fil.*,	Near *A. arabica*, Willd., an Arabian species, and *A. Wightii*, Baker of the Indian Peninsula.
CRASSULACEÆ.	
50 Kalanchoe farinacea, *Balf. fil.*	
,, robusta, *Balf. fil.*	
,, abrupta, *Balf. fil.*	
LYTHRARIEÆ.	
Punica protopunica, *Balf. fil.*,	Second species of the genus, differing markedly in its gynæceal characters from the generic type.
CUCURBITACEÆ.	
Eureiandra Balfourii, *Cogn.*,	Species of a genus only elsewhere represented by a species in Angola and one in central Africa.
Dendrosicyos socotrana, Balf. fil.,	Unique in the family for its arboreous habit.
BEGONIACEÆ.	
Begonia socotrana, *Hook. fil.*,	Allied to the south African *B. geranioides*, Hook. fil.
FICOIDEÆ.	
Tetragonia pentandra, *Balf. fil.*,	*T. microptera*, Fenzl. and *T. echinata*, Ait. south African species, are nearest allies.
UMBELLIFERÆ.	
Nirarathamnos asarifolius, Balf. fil.,	Allied to *Bupleurum*.
Carum pimpinelloides, *Balf. fil.*,	Annual. Has near alliance with *C. dichotomum*, Benth. and Hook. from Marocco.
60 ,, calcicolum, *Balf. fil.*,	Annual.
Peucedanum cordatum, *Balf. fil.*	
RUBIACEÆ.	
Dirichletia venulosa, *Balf. fil.*,	These species entail some modification in the generic description.
,, lanceolata, *Balf. fil.*,	
,, obovata, *Balf. fil.*,	
Placopoda virgata, Balf. fil.,	Allied to *Dirichletia*.
Hedyotis pulvinata, *Balf. fil.*	
,, bicornuta, *Balf. fil.*,	Curious fruit. Perhaps not of this genus.
,, stellarioides, *Balf. fil.*,	Allied to *H. Wallichii*, Kurz, from Tenasserim and Nicobar.
Mussænda capsulifera, *Balf. fil.*,	Close to *M. luteola*, Del. from Nile-land. The capsular fruit is peculiar in the genus.
70 Gaillonia tinctoria,	

LIST OF ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

	RUBIACEÆ—*continued.*	Remarks, Affinities, &c.
	Gaillonia puberula, *Balf. fil.*	
	,, thymoides, *Balf. fil.*	
	VALERIANEÆ.	
	Valerianella affinis, *Balf. fil.*, . . .	Annual. Allied to the Spanish *V. divaricata*, Lange and other Mediterranean species.
	COMPOSITÆ.	
	Vernonia Cockburniana, *Balf. fil.*	
	Psiadia Schweinfurthii, *Balf. fil.*, . .	Allied to *P. dodonæfolia*, Steetz from Zanzibar and Madagascar, which may be only a form of *P. arabica*, Jaub. and Spach., the only Asian species.
	Pluchea glutinosa, *Balf. fil.*	
	,, aromatica, *Balf. fil.*	
	,, obovata, *Balf. fil.*	
	Helichrysum rosulatum, *Oliv. & Hiern.*	
80	,, sphærocephalum, *Balf. fil.*	
	,, arachnoides, *Balf. fil.*, .	Annual. Belongs to section *Leptorhiza* of *Euhelichrysum*, which is south African; nearest ally is probably *H. micropoides*, DC. from south Africa.
	,, aciculare, *Balf. fil.*	
	,, Nimmoanum, *Oliv. & Hiern.*	
	,, suffruticosum, *Balf. fil.*	
	,, gracilipes, *Oliv. & Hiern.*, .	Annual usually.
	Pulicaria diversifolia, *Balf. fil.*, . .	Allied to *P. petiolaris*, Jaub. and Spach., a plant of Abyssinia, Nubia, and perhaps Somali-land.
	,, stephanocarpa, *Balf. fil.*, . .	Differs very markedly from the generic character.
	,, vieræoides, *Balf. fil.*, . .	In habit differs from type of genus.
	Senecio Scotti, *Balf. fil.*, ...	Belongs to section *Kleinia*, which is essentially south African. Nearest ally in *S. longiflorum*, Oliv. and Hiern., a south and tropical African species.
90	Euryops socotranus, *Balf. fil.*, . . .	Nearest ally is *E. trifurcatus*, a south African form. The genus is typically south African, but has a tropical African and an Arabian representative.
	Dicoma cana, *Balf. fil.*, ...	Has some affinity with the south African *D. diacanthoides*, Less.
	Lactuca rhynchocarpa, *Balf. fil.*	
	,, crassifolia, *Balf. fil.*	
	Prenanthes amabilis, *Balf. fil.*	
	Launæa crepoides, *Balf. fil.*, . . .	Near *L. bellidifolia*, Cass., a species of Africa, India, and Mascarene Islands.
	PLUMBAGINEÆ.	
	Vogelia pendula, *Balf. fil.*, . . .	Resembles the south African *V. africana*, Lamk.
	SAPOTACEÆ.	
	Sideroxylon fimbriatum, *Balf. fil.*, . .	Allied to *S. diospyroides*, Baker from Zanzibar.
	EBENACEÆ.	
	Euclea laurina, *Hiern.*	
	,, Balfourii, *Hiern.*, ...	Related to the south African *E. ovata*, Thunb. and *E. divinorum*, Hiern.
	OLEACEÆ.	
100	Jasminum rotundifolium, *Balf. fil.*, . .	Allied to *J. mauritianum*, Bojer from Mauritius and Seychelles.
	APOCYNACEÆ.	
	Socotora aphylla, Balf. fil., ...	Without near affinity.
	ASCLEPIADEÆ.	
	Ectadiopsis volubilis, *Balf. fil.*, . .	Both differ considerably from the generic type.
	,, brevifolia, *Balf. fil.*, . .	
	Mitolepis intricata, Balf. fil., . . .	Allied to south African and Madagascar genera.

LIST OF ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

	Remarks, Affinities, &c.
ASCLEPIADEÆ—*continued.*	
Cochlanthus socotranus, Balf. fil., . .	Allied to south African and Madagascar genera.
Secamone socotrana, *Balf. fil.*, . .	Related to Madagascar and Mascarene species.
Vincetoxicum linifolium, *Balf. fil.*, . .	Differs in its flagelliform branches and twining habit from old world species.
Marsdenia robusta, *Balf. fil.*	
Boucerosia socotrana, *Balf. fil.*, . .	Allied to *B. sinaica*, Dcne. and *B. Aucheriana*, Dcne., Arabian species.
GENTIANACEÆ.	
110 Exacum cæruleum, *Balf. fil.*	
,, affine, *Balf. fil.*, . . .	Annual. Allied to *E. petiolare*, Griseb., a plant of the Indian Peninsula.
,, gracilipes, *Balf. fil.*, . . .	Annual.
BORAGINEÆ.	
Cordia obovata, *Balf. fil.*, . . .	Allied to *Cordia crenata*, Del., a native probably of Arabia.
,, obtusa, *Balf. fil.*	
Heliotropium dentatum, *Balf. fil.*, . .	Annual. Allied to *H. Ophioglossum* Stocks from Scindh, Beloochistan, and also Somali-land.
,, odorum, *Balf. fil.*, . .	Allied to *H. indicum*, Linn., a wide-spread species.
,, nigricans, *Balf. fil.*	
Trichodesma Scotti, *Balf. fil.*	
,, microcalyx, *Balf. fil.*, . .	Allied to *T. africanum*, R. Br., a tropical African and south-west Asian plant.
120 ,, laxiflorum, *Balf. fil.*	
Cystistemon socotranum, Balf. fil., . .	Allied to *Borago*.
CONVOLVULACEÆ.	
Ipomœa laciniata, *Balf. fil.*	
Convolvulus filipes, *Balf. fil.*, . . .	Allied to *C. chondrilloides*, Boiss., a plant of south Persia.
,, sarmentosus, *Balf. fil.*	
Porana obtusa, *Balf. fil.*, . . .	Differs freely from type of genus.
Breweria pedunculata, *Balf. fil.*	
,, glomerata, *Balf. fil.*	
,, fastigiata, *Balf. fil.*, . . .	Differs markedly from generic type.
SOLANACEÆ.	
Withania Riebeckii, *Schweinf.*, . .	A near ally of *W. somnifera*, Dunal, which also occurs on Socotra.
SCROPHULARINEÆ.	
130 Camptoloma villosa, *Balf. fil.*, . .	Annual. Only one other species known; it grows in south Africa.
Campylanthus spinosus, *Balf. fil.*, . .	A small genus with sporadic distribution.
Graderia fruticosa, *Balf. fil.*, . . .	Only two other species in genus—one south African, the other Angolan.
Xylocalyx asper, Balf. fil., . . .	Allied to south African and Madagascar genera.
ACANTHACEÆ.	
Ruellia insignis, *Balf. fil.*	
,, carnea, *Balf. fil.*, . . .	Perhaps near *R. Curori*, T. Anders., a west tropical African species.
Blepharis spiculifolia, *Balf. fil.*, . .	Differs slightly from generic type.
Barleria aculeata, *Balf. fil.*	
,, tetracantha, *Balf. fil.*, . .	Differ from generic type in ovarian characters.
,, argentea, *Balf. fil.*, . . .	
140 Neuracanthus aculeatus, *Balf. fil.* . .	Differ somewhat from generic type.
,, capitatus, *Balf. fil.*, . .	
Ballochia amœna, Balf. fil., . . .	Near the monotypic Cameroon genus *Oreacanthus*.
,, *rotundifolia*, Balf. fil., . .	
,, *atrovirgata*, Balf. fil., . .	
Justicia rigida, *Balf. fil.*, . . .	Nearest *J. incana*, T. Anders., a south African species.

LIST OF ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

		Remarks, Affinities, &c.
	ACANTHACEÆ—*continued.*	
	Trichocalyx obovatus, Balf. fil.,	Near *Justicia*.
	,, *orbiculatus*, Balf. fil.,	Near *Justicia*.
	Anisotes diversifolius, *Balf. fil.*,	Two other species known—one Arabian, the other east tropical African. The Socotran species has also a distinct variety.
	Rhinacanthus scoparius, *Balf. fil.*	
150	*Ancalanthus paucifolius*, Balf. fil.,	With some American affinities.
	Ecbolium striatum, *Balf. fil.*,	Only one other species known, which is widely dispersed in tropical Asia and Africa. The Socotran species has also a distinct variety.
	Dicliptera effusa, *Balf. fil.*	
	,, ovata, *Balf. fil.*	
	Hypoestes pubescens, *Balf. fil.*	
	SELAGINEÆ.	
	Cockburnia socotrana, Balf. fil.,	Allied to the Mediterranean *Globularia*.
	VERBENACEÆ.	
	Cœlocarpus socotranus, Balf. fil.,	With strong south American affinities.
	Clerodendron galeatum, *Balf. fil.*,	Allied to the African *C. myricoides* and *C. pilosus*, Benth. and Hook.
	,, leucophlœum, *Balf. fil.*	
	LABIATÆ.	
	Orthosiphon ferrugineus, *Balf. fil.*,	Perhaps allied to *O. somalensis*, Vatke, a Somali-land plant.
160	Lavandula Nimmoi, *Benth.*,	Allied to the Aden *L. setifera*, T. Anders.
	Leucas virgata, *Balf. fil.*	
	Lasiocarys spiculifolia, *Balf. fil.*	
	,, flagellifera, *Balf. fil.*	
	Teucrium prostratum, *Balf. fil.*,	Allied to *T. Polium*, Linn., a plant of Mediterranean and Oriental regions.
	,, petiolare, *Balf. fil.*,	Has alliance with *T. buxifolium*, Schreb., a south Spain plant.
	GENUS ANOMALUM.	
	Wellstedia socotrana, Balf. fil.,	Quite aberrant genus. Allied to Verbenaceæ or Borragineæ.
	ILLECEBRACEÆ.	
	Haya obovata, Balf. fil.,	Annual. Allied to the monotypic *Illecebrum* of Europe and north Africa.
	Lochia bracteata, Balf. fil.,	Allied to *Gymnocarpos*, a monotypic genus, reaching from Canary Islands to Scindh.
	AMARANTACEÆ.	
	Aerua microphylla, *Moq.*	
170	,, revoluta, *Balf. fil.*	
	THYMELÆACEÆ.	
	Lasiosiphon socotranus, *Balf. fil.*,	Differs markedly from generic type.
	SANTALACEÆ.	
	Osyris pendula, *Balf. fil.*,	Has curious dimorphism in staminate flowers.
	EUPHORBIACEÆ.	
	Euphorbia leptoclada, *Balf. fil.*	
	,, socotrana, *Balf. fil.*	
	,, obcordata, *Balf. fil.*,	Allied to *E. cuneata*, Vahl from Arabia.
	,, Schweinfurthii, *Balf. fil.*	
	,, oblanceolata, *Balf. fil.*	
	,, arbuscula, *Balf. fil.*,	Allied to the Canary Island *E. aphylla*, Brouss. We have referred another form to this as a variety. Possibly it is a distinct species.

LIST OF ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

		Remarks, Affinities, &c.
	EUPHORBIACEÆ—*continued.*	
	Euphorbia spiralis, *Balf. fil.*	
180	Phyllanthus filipes, *Balf. fil.*	
	Securinega Schweinfurthii, *Balf. fil.*, .	Allied to south European *S. buxifolia*, Müll. Arg.
	Jatropha unicostata, *Balf. fil.*	
	Croton sarocarpus, *Balf. fil.*	
	,, sulcifructus, *Balf. fil.*, . . .	Allied to *C. zambesicus*, Müll. Arg. from east tropical Africa.
	,, elæagnoides, *Balf. fil.*, . . .	Has affinity with the south African *C. gratissimus*, Burch. and the west African *C. amabilis*, Müll. Arg.
	,, socotranus, *Balf. fil.*	
	Cephalocroton socotranus, *Balf. fil.*, .	Modifies the generic character. Only two other species known, both tropical African.
	Tragia dioica, *Balf. fil.*, ...	Allied to the widely spread species *T. involucrata*, Jacq. and to the tropical African and Arabian *T. mitis*, Hochst.
	URTICACEÆ.	
	Dorstenia gigas, *Schweinf.*, . . .	Perhaps allied to *D. radiata*, Lamk., an Arabian plant.
190	Ficus socotranus, *Balf. fil.*, . . .	Near *F. platyphylla*, Caill., a Nubian species.
	ORCHIDEÆ.	
	Habenaria socotrana, *Balf. fil.*, . .	Nearly related to *H. attenuata*, Hook. fil., a plant of the Cameroon Mountains.
	IRIDEÆ.	
	Babiana socotrana, *Hook. fil.*, . . .	Nearest to *B. plicata*, G., a south African species.
	ARYLLIDACEÆ.	
	Crinum Balfourii, *Baker*, ...	Nearest alliance with two Himalayan species *C. amœnum*, Roxb. and *C. longifolium*, Roxb.
	Hæmanthus grandifolius, *Balf. fil.*	
	DIOSCOREACEÆ.	
	Dioscorea lanata, *Balf. fil.*	
	LILIACEÆ.	
	Aloe Perryi, *Baker.*	
	,, squarrosa, *Baker*, ...	Allied to the south African *A. consobrina*, Salm-Dyck.
	Dracæna Cinnabari, *Balf. fil.*, . .	Allied to *D. Draco*, Linn. from Canary Islands, to *D. Ombet*, Kotsch. and Peyr. from Nubia, and to *D. schizantha*, Baker from Somali-land.
	Anthericum graptophyllum, *Baker*, .	Allied to *A. nubicum*, Baker, a Nubian plant, and *A. inconspicuum*, Baker from Somali-land.
200	Dipcadi Balfourii, *Baker*, . . .	Allied to the Mediterranean *D. serotinum*, Medic.
	Urginea porphyrostachys, *Baker*, . .	*U. anthericoides*, Steinh., an Algerian plant, is its nearest alliance.
	GRAMINEÆ.	
	Eriochloa vestita, *Balf. fil.*, . . .	Probably allied to the Indian *E. punctata*, Hamilt.
	Panicum rigidum, *Balf. fil.*	
	Rhynchelytrum microstachyum, *Balf. fil.*,	Annual. The Nubian *R. grandiflorum*, Hochst. and another species from Abyssinia are the only other ones in the genus. The Socotran species has a distinct variety.
	Lepturus tenuis, *Balf. fil.*, ...	Annual. *L. filiformis*, Linn., a Mediterranean species, is an ally, and also the Australian and south Pacific *L. repens*, R. Br.
206	*Ischnurus pulchellus*, Balf. fil., . .	Allied to the monotypic Indian *Oropetium.*

Of the 136 genera to which the endemic species belong, the large number of 98 are represented by endemic species only; and of the 20 endemic genera 18 are monotypic,—the exceptions being *Ballochia*, which is tritypic, and

Trichocalyx, which is ditypic. An analysis of the generic constitution of the endemic flora gives the subjoined table illustrating the geographical area of the several genera :—

TABLE SHOWING DISTRIBUTION OF GENERA WITH ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA.

Genera.	Endemic.	Widely spread in old and new worlds.	Widely spread in old world only.	New world only.	Restricted area in Africa and Asia.	Africa not Asia.	Asia not Africa.	Mediterranean and Orient.	Remarks.
Cocculus,			×						Chiefly African and Asian.
Parsetia,								×	
Brassica, T.*			×						Chiefly northern hemisphere.
Lachnocapsa,	×								Affinities doubtful.
Cleome,		×							
Reseda, T.								×	
Alsodeia,		×							Chiefly American.
Polycarpæa,		×							Scarcely represented in America.
Hypericum, T.		×							Temperate regions and hills in tropics only.
Hibiscus,		×							
Melhania,					×				Mostly African. Extending to Australia.
Grewia,			×						
Corchorus,		×							
Elæocarpus,							×		Although absent from Africa, has some species in Madagascar and the Mascarene Islands, and is widely spread in the old-world tropics, south Pacific, and Australia.
Dirachma,	×								Allied to the south American monotypic genera *Wendtia* and *Balbisia*.
Thamnosma,				×					Has two species out of Socotra, one in California, and one in Texas. Besides *Peganum* is the only new-world genus of true rues.
Boswellia,					×				
Balsamodendron,					×				
Vitis,		×							
Allophylus,		×							Chiefly American.
Rhus,		×							The Socotran endemic species is almost conspecific with one in Birma. Not tropical.
Odina,					×				
Crotalaria,		×							Attains a maximum in Africa.
Priotropis,							×		Has only one species out of Socotra which inhabits eastern tropical Himalayas.
Trigonella, T.			×						
Lotus, T.			×						Temperate regions and hills in tropics only.
Indigofera,		×							Attains a maximum in tropical and south Africa.
Tephrosia,		×							Attains a maximum in south Africa, and tropical and sub-tropical Australia.
Taverniera,					×				Extends from Nubia through Persia and Beloochistan to India.
Ormocarpum,		×							Small genus with two Mexican, one Australian, three tropical African, and one tropical Asian and African species, besides the Socotran one.
Arthrocarpum,	×								Allied to *Ormocarpum*, and to the American *Chætocalyx*, *Nissolia*, and similar genera.
Dichrostachys,					×				Small genus with an Australian, an Australian and tropical Asian, and two or three tropical and south African species.
Acacia,		×							
Kalanchoe,		×							Chiefly tropical and south African.
Punica,							×		Has only one species out of Socotra, the pomegranate, supposed to be native of the region embracing Persia, Kurdistan, Affghanistan, and Beloochistan.

* Indicates large distribution in temperate regions.

TABLE SHOWING DISTRIBUTION OF GENERA WITH ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

Genera.	Endemic.	Widely spread in old and new worlds.	Widely spread in old world only.	New world only.	Restricted area in Africa and Asia.	Africa not Asia.	Asia not Africa.	Mediterranean and Orient.	Remarks.
Eureiandra, . .						×			Has only two species outside of Socotra—one in Angola, one in central Africa.
Dendrosicyos, . .	×								Unique on account of the arboreous habit.
Begonia, . . .		×							
Tetragonia, . .		×							Attains a maximum in south Africa. Not known from the adjacent coasts of Asia.
Nirarathamnos, .	×								Allied to the cosmopolitan genus *Bupleurum*.
Carum, . . T.		×							Chiefly old world.
Peucedanum, . T.		×							Chiefly northern hemisphere.
Dirichletia, . .						×			Only three species known outside of Socotra, from east tropical Africa and Madagascar.
Placopoda, . .	×								Allied to *Dirichletia*.
Hedyotis, . . .		×							
Mussænda, . .					×				Extending to the islands of the Indian and Pacific Oceans.
Gaillonia, . . .					×				
Valerianella, . T.		×							Chiefly northern hemisphere.
Vernonia, . . .		×							Chiefly Brazilian.
Psiadia, . . .					×				Chiefly tropical and subtropical Africa, Madagascar, and Mascarene Islands. One species extends from tropical Africa to Arabia.
Pluchea, . . .		×							Chiefly American.
Helichrysum, . .			×						Chiefly south Africa, highlands of tropical Africa, Mascarene Islands, and Australasia.
Pulicaria, . . T.								×	Headquarters in the Mediterranean region. One species is south African.
Senecio, . . .		×							The section *Kleinia* of the Socotran plant is chiefly south African.
Euryops, . . .					×				Almost entirely south African. One species is found in Arabia, and the same one probably also in Nile-land, and one grows on Kilima Njaro.
Dicoma, . . .					×				Has headquarters in south Africa, with a few tropical African and one Indian species.
Lactuca, . . T.		×							Chiefly old world.
Prenanthes, . T.							×		Northern hemisphere, chiefly American. Though absent from Africa, found in Canary Islands, also Europe and northern India.
Launæa, . . .			×						Extends from Canary Islands through Mediterranean region, and occurs in south Africa and in India (Peninsula).
Vogelia, . . .					×				Only three species. One is south African, one occurs in north-west India and Arabia, and reaches Socotra, forming an endemic variety; the third is the endemic Socotran plant.
Sideroxylon, . .		×							
Euclea, . . .						×			Only south and tropical African.
Jasminum, . . .		×							Chiefly old world. A few south American.
Socotora, . . .	×								Quite aberrant.
Ectadiopsis, . .						×			A small east tropical and south African genus.
Mitolepis, . . .	×								Allied to south African and Madagascar genera.
Cochlanthus, . .	×								Allied to south African and Madagascar genera.
Secamone, . . .					×				Extends to Australia. The section of the genus represented in Socotra is Mascarene and Madagascar only.
Vincetoxicum, . .		×							Habit of Socotran species resembles that of west Indian forms.
Marsdenia, . .		×							
Boucerosia, . .			×						Northern hemisphere.
Exacum, . . .		×							Chiefly in cooler regions.
Cordia, . . .		×							Chiefly American.
Heliotropium, . T.		×							
Trichodesma, . .					×				Extending to Australia.
Cystistemon, . .	×								Probably closely related to the Mediterranean genus *Borago*.
Ipomœa, . . .		×							
Convolvulus, T.		×							

TABLE SHOWING DISTRIBUTION OF GENERA WITH ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

Genera.	Endemic.	Widely spread in old and new worlds.	Widely spread in old world only.	New world only.	Restricted area in Africa and Asia.	Africa not Asia.	Asia not Africa.	Mediterranean and Orient.	Remarks.
Porana,							×		A small genus of India and the Malay Archipelago, extending to Australia. Also Madagascar, but not African.
Breweria,		×							
Withania,								×	Reaches the Canary Islands.
Camptoloma,						×			Only one other species outside of Socotra, at Elephant's Bay, south Africa.
Campylanthus,							×		Only four other species outside of Socotra. One in Aden reaches to Scindh, one occurs in Scindh and Beloochistan, and two grow in Cape de Verde Islands.
Graderia,						×			Only two species known outside of Socotra; one being south African, the other, undescribed, is from Angola.
Xylocalyx,	×								Allied to *Graderia* and adjacent genera.
Ruellia,		×							Headquarters in tropical America.
Blepharis,					×				
Barleria,					×				Some American.
Neuracanthus,					×				More Asian than African.
Ballochia,	×								Tritypic. Allied to the monotypic *Oreacanthus* of the Cameroon highlands and other tropical African genera.
Justicia,		×							
Trichocalyx,	×								Ditypic. Allied to the widely distributed *Justicia*.
Anisotes,					×				Has only two representatives outside of Socotra—one Arabian, the other east tropical African.
Rhinacanthus,					×				Reaches Madagascar.
Ancalanthus,	×								Allied to the Brazilian genus *Schaueria*.
Ecbolium,					×				There is only one species of the genus outside of Socotra, and it is widely spread in tropical Asia and Africa. The Socotran plant has a distinct variety in addition to the specific form.
Dicliptera,		×							
Hypoestes,		×							
Cockburnia,	×								Allied to *Globularia*, a genus of the Mediterranean region.
Cœlocarpus,	×								Allied to the American genus *Citharexylum*.
Clerodendrón,		×							Mostly Old World.
Orthosiphon,					×				Extends to Australia.
Lavandula,								×	Reaches Canary Islands on the west, and India on the east.
Leucas,					×				Extends to Australia.
Lasiocarys,						×			Three species are known outside of Socotra—one is south African, and the two others are Abyssinian.
Teucrium, T.		×							Attains a maximum in Mediterranean region.
Wellstedia,	×								Quite aberrant.
Haya,	×								Allied to the monotypic *Illecebrum* of Europe and west Africa.
Lochia,	×								Allied to the monotypic *Gymnocarpos*, which spreads from the Canary Islands to Scindh.
Aerua,					×				
Lasiosiphon,					×				Chiefly south African; also Madagascar.
Osyris,			×						Occurs in south Europe.
Euphorbia,		×							
Phyllanthus,		×							
Securinega,		×							
Jatropha,		×							
Croton,		×							
Cephalocroton,						×			Has only two species outside of Socotra—one in east tropical Africa, the other Nile-land.
Tragia,		×							
Dorstenia,		×							Chiefly American and tropical African. Two species are Asian, one in Arabia, and one in India.
Ficus,		×							
Habenaria, T.		×							
Babiana,						×			South African entirely.
Crinum,		×							

TABLE SHOWING DISTRIBUTION OF GENERA WITH ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA—*continued.*

Genera.	Endemic.	Widely spread in old and new worlds.	Widely spread in old world only.	New world only.	Restricted area in Africa and Asia.	Africa not Asia.	Asia not Africa.	Mediterranean and Orient.	Remarks.
Hæmanthus, . .						×			Essentially south African; a few tropical African species.
Dioscorea, . . .		×							
Aloe, ...						×			Headquarters south Africa, but extending through tropical Africa, the Atlantic and Indian Ocean Islands.
Dracæna, . . .			×						The section to which the Socotran species belongs is restricted to Canary Islands, Nubia, and Somali-land.
Anthericum, . .						×			Spread through Europe, Africa, America, but absent from Asia.
Dipcadi, . . .					×				Reaches Canary Islands on the west, and India on the east.
Urginea, . . .					×				Reaches Canary Islands on the west, and India on the east.
Eriochloa, . . .		×							
Panicum, . . .		×							
Rhynchelytrum, .						×			Has only two species outside of Socotra; one is Abyssinian, the other Æthiopian.
Lepturus, . . T.			×						
Ischnurus, . . .	×								Allied to the Indian monotypic *Oropetium*.
	20	54	11	1	26	13	6	5	

A glance at the features of the above table may not be without interest. Amongst the twenty endemic genera the near affinities of *Lachnocapsa, Dendrosicyos, Socotora,* and *Wellstedia* are obscure, and so much so in the case of the last-mentioned genus that its order is not certain, and it has to be treated as an anomalous gamopetalous genus allied to Borragineæ or Verbenaceæ. *Dirachma* and *Cœlocarpus* have very close south American affinities; and American relationships also appear in *Arthrocarpum* and *Ancalanthus. Placopoda, Mitolepis, Cochlanthus, Xylocalyx,* and *Ballochia* find their nearest allies in south and tropical African and Madagascar genera. With genera of wide distribution *Nirarathamnos* and *Trichocalyx* claim affinity. *Cystistemon* and *Cockburnia* have Mediterranean relations, and the next-of-kin to *Haya* and *Lochia* are found in monotypic genera of Europe and north Africa, and of the region extending from the Canary Islands on the west to Scindh on the east respectively. *Ischnurus* has a monotypic Indian alliance. Whilst these are the undoubted endemic genera of the flora, it is to be remarked that a number of the endemic species which are included in genera of extra-Socotran distribution can only be so included by straining or modifying the characters of these genera as they are at present described; and this variation from the generic character is an interesting feature in the plants of Socotra. The following genera, for instance, are modified in conspicuous features by Socotran plants:—

Lotus, Dichrostachys, Punica, Dirichletia, Pulicaria, Ectadiopsis, Secamone, Blepharis, Barleria, Neuracanthus, Lasiosiphon, and *Cephalocroton.* In some cases the aberration of the species are of no great extent; in others the modification of the genus required is so great that it becomes a question whether or not the Socotran plants have sufficient individuality to form a distinct and new genus.

Fifty-four genera with endemic species have a wide geographical area in both the old and new world. Most of them are conspicuously tropical genera, but some have a considerable range in extra-tropical and temperate regions. *Hypericum, Carum, Peucedanum, Valerianella, Teucrium, Habenaria,* for instance, are genera with considerable temperate development, and in the tropics found usually in mountainous districts. *Rhus* has but a small tropical representation. The majority of genera of the category we are now considering are extensive ones, with almost cosmopolitan range within their latitudes, but such ones as *Crotalaria, Indigofera, Tephrosia, Acacia, Kalanchoe,* and *Tetragonia* may be said to attain their maxima in tropical and south Africa, and the section of *Senecio* which occurs in Socotra is south African. *Dorstenia* has a very large development in Africa, but few species are Asian; and *Tetragonia* is not known yet from the Orient region of Asia adjacent to Socotra.

Amongst the twelve genera of old-world distribution, only *Brassica* and *Lotus* have considerable range in temperate regions, and the latter especially frequents highlands in the tropics; *Helichrysum* has a maximum development in Africa, especially in south Africa, and has few representatives in Asia east of the Orient region, and *Launæa* extends from the Canary Islands to India.

The presence of *Thamnosma,* a genus with only two representatives, natives of southern north America, is one of those features of distribution in this region difficult to explain adequately.

Several of the twenty-six genera recorded in the table as of restricted area in Africa and Asia are deserving of notice. Several are small genera, with remarkable sporadic distribution. *Taverniera* is characteristically a genus of south-west Asia, but is also found in Nubia. *Psiadia* is essentially tropical and subtropical African, extending to Madagascar and the Mascarene Islands, but one species reaches Arabia, and thus it has Asian representation. *Euryops* is almost entirely south African, one species, however, occurs on Kilima Njaro, and another grows in Nile-land and Arabia. The tritypic *Vogelia* has one south African and one Arabian and north-west Indian species, the other being Socotran. *Anisotes,* also tritypic, has one Arabian species and one growing in east tropical Africa. *Ecbolium* is ditypic, the non-Socotran plant being widely spread in tropical Asia and Africa. *Lasiosiphon* has a maximum development in south Africa, and also occurs in Madagascar. *Secamone* is interesting, because of the Madagascar relationship of the Socotran species.

There are thirteen genera with endemic Socotran species which occur in

Africa, but are altogether absent from Asia. Of these *Anthericum* is a genus of wide distribution throughout Europe, America, and Africa; and it is a significant fact that only one of the others occurs off the African continent. This one is *Aloe*, which has its headquarters in south Africa, and reaches the Atlantic and Mascarene Islands and the Mediterranean region. Thus eleven of the genera are peculiarly continental African, and their geographical areas are so remarkable that I add here a table to exhibit them :—

TABLE SHOWING DISTRIBUTION OF ELEVEN GENERA WITH ENDEMIC SPECIES IN THE PHANEROGAMIC FLORA OF SOCOTRA WHICH ARE CONFINED TO THE AFRICAN CONTINENT.

	South Africa.	East tropical Africa.	Madagascar.	Abyssinia.	Angola.	Central Africa.	Tropical Africa generally.	
Eureiandra, . . .					×	×		Tritypic. Third species Socotran.
Dirichletia, . . .		×	×					Seven species. Three endemic in Socotra.
Euclea, ...	×						×	. . . . .
Ectadiopsis, . . .	×	×						Six species. Two, perhaps three, endemic in Socotra.
Camptoloma, . . .	×							Ditypic. Second species endemic in Socotra.
Graderia, . . .	×				×			Tritypic. Third species endemic in Socotra.
Lasiocarys, . . .	×			×				Five species. Two endemic in Socotra.
Cephalocroton, . .		×				×		Tritypic. Third species endemic in Socotra.
Babiana, . . .	×							. . . . .
Hæmanthus, . . .	×						×	. . . . .
Rhynchelytrum, . .				×				Tritypic. Third species endemic in Socotra.

The affinities with the south African flora, and with that of the higher lands upon the west, east, and north-east of Africa, is so clearly brought out in this table that no words are needed to emphasise the relationship. But I may just note this interesting fact, that three of the genera are Monocotyledones. There are only fifteen Socotran genera of Monocotyledones with endemic species; of these one is itself endemic, and five are African, but absent from Asia.

Of no less interest than the African genera which are not Asian, are the six Asian genera which are not African. *Prenanthes* is a large genus with a wide temperate distribution, chiefly American, but extending to the Canary Islands, Europe, and northern India, without representation on the African continent. *Elæocarpus* and *Porana* are genera of considerable size and area in the old-world tropics, both reaching Australia, and occurring in India and Madagascar, the former also in the Mascarene Islands, and their absence from Africa, in view of their last-mentioned localities, is striking. The presence of the ditypic *Priotropis*, of which the only other species inhabits tropical districts of the eastern Himalayas, from Khasia to Sikkim, is an Indian relationship of great importance. Lastly, *Punica*, of which the cultivated *P. Granatum* is the only other known species, is supposed to be native of the region including Persia, Kurdistan, Affghanistan, and Beloochistan; and *Campylanthus*, with four non-Socotran species, has one species at Aden,

which is also found in Scindh, another is native of Scindh and Beloochistan, and two inhabit the Cape de Verde Islands.

There remain five genera which do not quite fall into any of the groups already noted. Of these *Farsetia, Reseda, Withania,* and *Lavandula* are genera of the Mediterranean and Orient regions, with varying extensions; and *Pulicaria* has also its greatest development in the Mediterranean region.

Looking now at the non-endemic species of Phanerogams, we find that ninety are common weeds in the tropics or warmer regions of all parts of the world, some of them reaching into temperate regions; forty-four of them being annuals. The greater number of these are introduced plants in Socotra, some of quite recent date, and cannot be considered as established in the island; others have now incorporated themselves with the indigenous vegetation. The following is a list of those cosmopolitan tropical plants :—

LIST OF SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA COSMOPOLITAN IN THE TROPICS, SOME EXTENDING TO SUBTROPICAL AND TEMPERATE REGIONS; MANY ARE WEEDS OF CULTIVATION, AND INTRODUCED INTO SOCOTRA.

Argemone mexicana. Annual.
Cleome viscosa. Annual.
Gynandropsis pentaphylla. Annual.
Capparis spinosa.
Arenaria serpyllifolia. Annual.
Polycarpæa corymbosa. Annual.
Portulacca oleracea. Annual.
Sida cordifolia.
,, rhombifolia.
,, humilis. Annual.
Tribulus terrestris. Annual.
Fagonia cretica. Annual. Represented by an endemic variety, and also by the Arabian variety.
Oxalis corniculata. Annual.
Dodonæa viscosa.
Melilotus parviflorus. Annual.
Tephrosia purpurea.
Zornia diphylla. Annual.
Desmodium triflorum.
Teramnus labialis. Annual.
Canavalia ensiformis.
Vigna luteola. Annual.
Rhynchosia minima.
Cassia Sophera.
,, Tora. Annual.
Lythrum hyssopifolium. Annual.
Momordica Charantia, *var.* abbreviata.
Mollugo hirta. Annual.
Hydrocotyle asiatica.
Oldenlandia corymbosa. Annual.
Ageratum conyzoides. Annual.
Siegesbeckia orientalis. Annual.
Eclipta alba. Annual.
Blainvillea rhomboidea. Annual.
Bidens pilosa. Annual.
Sonchus oleraceus. Annual.
Anagallis arvensis, *var.* cærulea. Annual.
Ipomœa biloba.
,, scabra. Annual.
Evolvulus alsinoides.
Dichondra repens.
Cressa cretica.
Solanum nigrum. Annual.
Datura fastuosa, *var.* alba. Annual.
Herpestes Monnieria.
Lippia nodiflora.
Avicennia officinalis.
Boerhaavia diffusa.
,, scandens.
Achyranthes aspera.
,, ,, *var.* sicula
Chenopodium murale. Annual.
Polygonum glabrum.
Peperomia reflexa. Annual. Represented by a Himalayan and Ceylon form.
Fluggea microcarpa.
Potamogeton natans. Represented by European and west Indian form.
,, fluitans.
,, pectinatus.
Ruppia maritima.
Naias major. Annual.
Cyperus lævigatus.
,, amabilis.
,, aristatus. Annual.
,, compressus. Annual.
,, difformis. Annual.
,, rotundus.
Heleocharis Chætaria.
,, capitata.
Fimbristylis diphylla.
,, ferruginea.
,, autumnalis.
,, glomerata.
Cladium Mariscus.
Paspalum distichum.
Panicum sanguinale. Annual.
,, paspaloides.
,, colonum. Annual.
Oplismenus Burmanni.
,, compositus.
Setaria glauca. Annual.
,, viridis. Annual.
,, verticillata. Annual.
Pennisetum cenchroides.
Tragus racemosus. Annual.
Imperata arundinacea.
Heteropogon hirtus.
Cynodon dactylon.
Chloris barbata.
Eleusine ægyptiaca. Annual.
,, indica. Annual.
Eragrostis pilosa. Annual.
,, ciliaris. Annual.

A considerable proportion of the non-endemic plants have a wide distribution in the tropics and warmer regions of the old world only, and do not reach America, some of them having an extension into temperate regions. Sixty-two species belong to this category, and they are enumerated in the following list. Some of them are plants which have been certainly introduced; nearly the whole of them are quite established as part of the flora of the island. Twenty-four of them are annuals.

LIST OF SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA WITH GENERAL OLD-WORLD DISTRIBUTION; SOME INTRODUCED IN SOCOTRA.

Ionidium suffruticosum. The only species of the genus in tropical Africa.
Portulacca quadrifida. Annual.
Talinum cuneifolium. Reaches Europe.
Tamarix gallica.
Abutilon fruticosum.
,, muticum.
Hibiscus vitifolius. Annual.
Corchorus acutangulus.
Zizyphus Jujuba.
,, Spina-Christi.
Vitis quadrangularis.
Medicago denticulata. Annual. Only in the northern hemisphere.
Indigofera cordifolia. Annual.
,, paucifolia.
,, viscosa. Annual.
Alysicarpus vaginalis. Annual.
Cassia Absus.
Ammania baccifera. Annual.
Momordica balsamina. Annual.
Citrullus Colocynthis.
Melothria punctata.
Oldenlandia Heynei.
Galium Aparine.
Vernonia cinerea. Annual.
Dichrocephala chrysanthemifolia. Annual.
Heliotropium ovalifolium. Annual.
,, strigosum.
Ipomœa obscura. Annual.
Solanum indicum.
Physalis minima. Annual.
Withania somnifera.
Striga hirsuta. Annual.
Asystasia coromandeliana.
Boerhaavia repens.
Digera arvensis.
Amarantus Blitum. Annual.
,, polygamus. Annual.
Pupalia lappacea.
Aerua javanica.
,, lanata. With an endemic variety.
Polygonum barbatum.
Phyllanthus maderaspatensis.
Acalypha indica. Annual.
Commelina benghalenis.
Juncus maritimus. Northern hemisphere only.
Naias graminea. Annual.
Cyperus pumilus, *var.* patens. Annual. The Socotran form is tropical African and Australian.
Cyperus umbellatus, *var.* cyperinus.
Kyllinga monocephala.
Fuirena glomerata. Annual.
Paspalum scrobiculatum.
Panicum eruciforme. Annual.
,, Petiveri. Annual.
Arthraxon molle.
Andropogon hirtus.
,, pertusus.
Chrysopogon Gryllus.
Anthistiria ciliata.
Apluda aristata.
Aristida adscensionis.
Eleusine verticillata. Annual.
Eragrostis plumosa. Annual.

The geographical areas of the remaining plants are more definite. One hundred and nine of them may be considered as inhabitants of the regions in Africa and Asia adjacent to Socotra, that is to say, occupying the north-east corner of Africa, including Nubia, Abyssinia, and Somali-land, and the south-west corner of Asia. Taking this region as a centre, they extend in a varying degree eastwards and westwards; eastwards passing through Persia and Beloochistan to Affghanistan and even Turkestan on the north; to Scindh, the Himalayas, and the Indian Peninsula, and even Ceylon on the south; westwards spreading through Syria and Egypt into the Mediterranean region and reaching south-west Europe and the Atlantic Islands, or passing more directly across tropical Africa to the Atlantic Islands—with not infrequently extensions to south Africa, to Madagascar, and to the Mascarene Islands. Some of these species have an exceedingly limited geographical area, in the case of others the range is very extensive. Some of the plants are perhaps introductions. The following is a list of the species having this distribution:—

LIST OF ONE HUNDRED AND NINE SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA WITH DISTRIBUTION IN NORTH-EAST AFRICA AND SOUTH-WEST ASIA.

Species.	Western limit.	Eastern limit.	Intermediate and further extension, Remarks.
Cocculus Leæba, . . .	De Verde Islands	India	Tropical Africa.
Farsetia longisiliqua, . .	Nubia	Arabia	
Sisymbrium erysimoides, .	Canary Islands	South Persia	Mediterranean region and Abyssinia. Annual.
Cleome papillosa, . . .	Nile-land	North-west India	Annual.
,, brachycarpa, . .	Nile-land	North-west India	
Cadaba longifolia, . . .	Abyssinia	Arabia	
Capparis aphylla, . . .	Nile-land	North-west India	
Ochradenus baccatus, . .	Nile-land	Scindh	
Polygala abyssinica, . .	Tropical Africa	North-west India	Also south Africa. Annual.
,, erioptera, . . .	De Verde Islands	North India	Tropical Africa. Annual.

LIST OF ONE HUNDRED AND NINE SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA WITH DISTRIBUTION IN NORTH-WEST AFRICA AND SOUTH-WEST ASIA—*continued.*

Species.	Western limit.	Eastern limit.	Intermediate and further extension, Remarks.
Gypsophila montana,	Somali-land	Arabia (Aden)	The Somali-land form is a viscid variety, which also occurs on Socotra.
Silene apetala,	Canary Islands	Affghanistan	Mediterranean region. Not African. Annual.
Polycarpæa spicata,	Nile-land	India	Annual. An endemic variety occurs on Socotra.
Malva parviflora,	Levant	North-west India	Nubia. Annual.
Sida grewioides,	Tropical Africa	North-west India	
Senra incana,	Nile-land	Scindh	
Hibiscus intermedius,	Tropical Africa	Scindh	Annual.
,, micranthus,	Tropical Africa	India	
Grewia populifolia,	Tropical Africa	North-west India	Also Mascarene Islands.
,, salvifolia,	Tropical Africa	Scindh	Also Johannas.
Corchorus Antichorus,	De Verde Islands	North India	Tropical Africa.
Linum gallicum,	Mediterranean region	Persia	Abyssinia. Annual.
Zygophyllum simplex,	De Verde Islands	Scindh	North tropical Africa; also south Africa. Annual.
,, album,	North Africa	Arabia	East Mediterranean region.
Medicago laciniata,	Canary Islands	Beloochistan	East Mediterranean region and north Africa; also south Africa. Annual.
,, minima,	Europe and west Asia	North India	Abyssinia. Annual.
Lotus arabicus, *var.* trigonellioides,	Canary Islands	Persia	North Africa. Annual.
Indigofera leptocarpa,	Nubia	Arabia	
,, argentea,	Nile-land	Scindh	
Tephrosia Apollinea,	Tropical Africa	Scindh	
Rhynchosia Memnonia,	Tropical Africa	Scindh	
Cassia obovata,	Tropical Africa	India	
,, holosericea,	Nile-land	Scindh	
Ludwigia palustris,	Europe	Persia	Also south Africa and north America.
Cucumis ficifolius, *var.* echinophorus,	Tropical Africa	Arabia	
,, prophetarum,	Tropical Africa	India	Annual.
,, dipsaceus,	Tropical Africa	Arabia	Annual.
Aizoon canariense,	Canary Islands	Scindh	Tropical Africa, also south Africa.
Trianthema pentandra,	Tropical Africa	North-west India	
Orygia decumbens,	Tropical Africa	Scindh	Also south Africa.
Oldenlandia Schimperi,	Tropical Africa	Arabia	
Vaillantia hispida,	De Verde and Canary Islands	South Persia	Mediterranean region and north Africa. Annual.
Vernonia spathulata,	Abyssinia	North-west India	
Volutarella Lippii,	Canary Islands	Arabia	South-east Spain and north Africa. Annual.
Dicoma tomentosa,	Tropical Africa	Indian Peninsula	
Heterachæna massaviensis,	Abyssinia	Beloochistan	Monotypic genus. Annual.
Reichardia tingitana,	Canary Islands	North-west India	Mediterranean region and tropical Africa. Annual.
Campanula dichotoma,	Canary Islands	Syria	Mediterranean region and north Africa. Annual.
Statice axillaris,	Egypt	Arabia	
Myrsine africana,	Canary Islands	North India	Tropical Africa, also south Africa.
Salvadora persica,	Tropical Africa	India	
Calotropis procera,	Canary Islands	India	Tropical Africa.
Erythræa Centaurium,	Europe	Persia	North Africa. Annual.
Cordia Rothii,	East tropical Africa	India	
Ehretia obtusifolia,	Abyssinia	Scindh	
Heliotropium zeylanicum,	Tropical Africa	India	
,, undulatum,	North Africa	Arabia	
,, rariflorum,	Nubia	Scindh	
,, pterocarpum,	Senegal	Arabia	Tropical Africa.
Ipomœa cardiosepala,	Senegal	Indian Peninsula	Tropical Africa.
Convolvulus glomeratus,	Abyssinia	North-west India	
,, siculus,	Canary Islands	Syria	Mediterranean region and north Africa. Annual.
Breweria latifolia,	Abyssinia	Scindh	
Cuscuta planiflora, *var.* globulosa,	Asia Minor	Persia	Not African. Annual.
Lycium europæum,	Canary Islands	North India	Mediterranean region and north Africa.

LIST OF ONE HUNDRED AND NINE SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA WITH DISTRIBUTION IN NORTH-EAST AFRICA AND SOUTH-WEST ASIA—*continued.*

Species.	Western limit.	Eastern limit.	Intermediate and further extension, Remarks.
Anticharis arabica,	Nile-land	Beloochistan	Annual.
Antirrhinum Orontium,	Europe, Canary Islands, and Azores	India	Mediterranean region and north Africa. Annual.
Scrophularia arguta,	Canary Islands	Persia	North Africa. Annual.
Lindenbergia sinaica,	Egypt	Persia	
Striga orobanchoides,	Tropical Africa	North-west India	Also north Africa. Annual.
Cistanche lutea,	Canary Islands	Persia	Mediterranean region and north Africa.
Orobanche cernua,	Mediterranean region and north Africa	North India	Also Australia.
,, ramosa,	Canary Islands and Europe	Persia	Mediterranean region and north Africa; also south Africa.
Pedalium Murex,	Tropical Africa	Indian Peninsula	Monotypic genus. Annual.
Ruellia patula,	Tropical Africa	Indian Peninsula	Also Madagascar. There are also two varieties of this on Socotra, one a Nile-land form and the other endemic.
Blepharis boerhaaviæfolia,	Tropical Africa	Indian Peninsula	Also Ceylon.
Justicia heterocarpa,	Abyssinia	Scindh	
Peristrophe bicalyculata,	De Verde Islands	India	Tropical Africa. Annual.
Hypoestes verticillaris,	Tropical Africa	Arabia	Also south Africa. The Socotran plant is a variety found in Angola, east tropical Africa, and south Africa.
Priva leptostachya,	Tropical Africa	India	Also south Africa.
Micromeria microphylla,	De Verde and Canary Islands	India	Mediterranean region and north-east Africa.
Leucas urticæfolia,	Nubia	India	Annual.
Plantago amplexicaulis,	Canary Islands	India	Mediterranean region and north Africa. Annual.
Suæda monoica,	Egypt	India	
Osyris arborea,	Tropical Africa	India	Also south Africa.
Euphorbia indica,	De Verde Islands	India	Tropical Africa. Annual.
,, Chamæsyce,	Mediterranean region and north Africa	Persia	Annual.
,, Schimperi,	Nubia	Persia	
Phyllanthus rotundifolius,	Tropical Africa	India	The Socotran plant is a tropical African variety.
Chrozophora tinctoria,	Mediterranean region and north Africa	Persia	Annual.
,, obliqua,	Egypt	North India	A variety also occurs which is spread along the shores of the Red Sea.
Ficus salicifolius,	Tropical Africa	Arabia	
Forskohlea viridis,	Atlantic Island	Arabia	Abyssinia.
Romulea purpurascens,	Mediterranean region	Socotra	The Socotran plant is an endemic variety.
Asphodelus fistulosus,	Atlantic Islands	Indian Peninsula	Mediterranean region and north Africa; also Mauritius. The Socotran plant is a variety with equally wide distribution. Annual.
Commelina Forskalæi,	De Verde Islands	India	Tropical Africa.
,, albescens,	Abyssinia	North-west India	
Cyperus proteinolepis,	Egypt	Arabia	The Egyptian plant is a variety which also occurs on Socotra; the type-form is not African.
,, conglomeratus,	Egypt	Affghanistan	Occurs as an endemic variety on Socotra.
Panicum turgidum,	Tropical Africa	Arabia	
Cenchrus Schimperi,	Tropical Africa	India	Annual.
Pennisetum dichotomum,	Egypt and Algeria	North-west India	
Andropogon laniger,	North Africa	North India	
Aristida murina,	Senegal and Egypt	Beloochistan	Annual.
Sporobolus spicatus,	Atlantic Islands	Arabia	Tropical Africa.
Melanocenchris Royleana,	North-east Africa	India	
Pappophorum Aucheri,	Egypt	Affghanistan	
Eragrostis cynosuroides,	Egypt	India	
Æluropus repens,	Mediterranean region	North-west India	

Some of the species included in the foregoing list have quite an exceptional eastern extension in Socotra, and cannot justly be considered as plants of the north-east corner of Africa and of south-west Asia. For instance, *Campanula dichotoma* and *Convolvulus siculus* are not known further east than Syria upon the mainland. Again some forms, whilst of Asiatic distribution, do not reach the African coast. This is the case with *Silene apetala* and *Cuscuta planiflora*, var. *globulosa*, which have a wide range on the north of the Red Sea, the latter reaching into Asia Minor, the former spreading as far as the Canary Islands.

Thirty-five Socotran species—of which seven are annuals—are found in Africa, but do not reach Asia, and the distribution of some of these is remarkable, bearing out the strong Abyssinian, south African and east and west tropical African highland relationships of the flora. As an example of extreme sporadic distribution, *Sarcostemma Daltoni* may be quoted, for it is known from the Cape de Verde Islands, and now turns up in Socotra. The relationships of these African species will be best understood from the following table :—

LIST OF THIRTY-FIVE SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA WHICH ARE AFRICAN BUT NOT ASIAN.

SPECIES.	DISTRIBUTION AND REMARKS.
Diceratella incana,	Somali-land. Genus tritypic, other species natives of Persia.
Mærua angolensis,	Tropical Africa.
Cadaba rotundifolia,	Nile-land.
Aberia abyssinica,	Abyssinia.
Hypericum lanceolatum,	Highlands of Africa, Madagascar, Mascarene Islands.
Hibiscus ternatus,	Tropical Africa. Annual.
Sterculia Triphaca,	From Abyssinia to Mozambique.
Rhus glaucescens,	Tropical and south Africa.
Crotalaria spinosa,	Tropical Africa. Annual.
Tephrosia subtriflora,	Abyssinia.
,, anthylloides,	Tropical Africa.
,, vicioides,	Nubia and Abyssinia.
Kalanchoe rotundifolia,	South Africa.
Dirichletia glaucescens,	Somali-land. Distribution of genus is referred to on page lxi.
Conyza Hochstetteri,	Abyssinia and Kilima Njaro.
Achyrocline luzuloides,	Somali-land, Nile-land, Upper Guinea.
,, Schimperi,	Nile-land, Mozambique. Annual.
Tripteris Lordii,	Upper Nubia. Essentially a south African genus; only two species are north African. Represented by an endemic variety on Socotra. Annual.
Wahlenbergia riparia,	Upper Guinea. Annual.
Euclea Kellau,	Abyssinia. Distribution of genus is referred to on page lxi.
Carissa Schimperi,	Abyssinia.
Adenium multiflorum,	Mozambique. Belongs to a genus of five species only, one of which occurs in Arabia, Nubia, and east tropical Africa; one grows in Senegambia and west tropical Africa; one at Aden, and one in Somali-land; the fifth is the Socotran and Mozambique plant.
Glossonema Revoili,	Somali-land. Genus of six or seven species natives of Arabia and tropical Africa; one is south African.
Sarcostemma Daltoni,	De Verde Islands.
Dæmia angolensis,	Tropical Africa.
Echidnopsis cereiformis,	Abyssinia. Monotypic genus.
Linaria hastata,	Abyssinia. Annual.
Orobanche abyssinica,	Abyssinia.
Leucas Neuflizeana,	Abyssinia, Dessi Island, east tropical Africa.
Buxus Hildebrandti,	Somali-land.
Australina capensis,	South Africa. Genus is Australian and south African.
Asparagus africanus,	Tropical and south Africa. Represented by an endemic variety on Socotra.
Fimbristylis hispidula,	Tropical Africa.
Panicum nudiglume,	Abyssinia, Egypt. Annual. The Abyssinian variety *major* also occurs on Socotra.
Panicum atrosanguineum,	Abyssinia.

Thirty-one Socotran species come into the category of Asian species which do not reach Africa, ten of them being annuals. The greater number of these are found in the adjacent Arabian continent, but there are several which are not reported from any portion of the south-west corner of Asia, and their occurrence has therefore additional interest. Some of the species of sporadic area may be accounted for in Socotra by supposing they are of comparatively recent introduction. Thus *Crotalaria retusa, Psoralea corylifolia, Spermacoce hispida, Leucas lanata* are, I think, certainly of this character. But the occurrence of *Hypericum mysorense, Indigofera Gerardiana,* and *Cylista scariosa* cannot be explained in this way. In the subjoined table the Asian species are enumerated, and their geographical area outside Socotra is mentioned.

LIST OF THIRTY-ONE SPECIES OF THE PHANEROGAMIC FLORA OF SOCOTRA WHICH ARE ASIAN BUT NOT AFRICAN.

SPECIES.	DISTRIBUTION AND REMARKS.
Viola cinerea,	Arabia, Persia to Affghanistan. Annual.
Polygala chinensis,	Tropical Asia and Australia. Annual.
Hypericum mysorense,	Indian Peninsula and Ceylon.
Grewia orbiculata,	Indian Peninsula, Ceylon ?
Acridocarpus orientalis,	Arabia. Genus of tropical and south Africa, Madagascar, and Arabia.
Geranium mascatense,	Arabia. Annual.
Balsamodendron Mukul,	Arabia, Persia, Scindh.
Crotalaria retusa,	Eastern tropical Asia. Introduced in Africa and America.
Psoralea corylifolia,	Arabia, India, Ceylon. Annual. Introduced.
Indigofera intricata,	Arabia, Persia.
,, Gerardiana,	Affghanistan, eastwards through sub-tropical and tropical Himalayas. Not known hitherto further west than Affghanistan.
Cylista scariosa,	Indian Peninsula, Mauritius. Genus is monotypic.
Ammannia multiflora,	Persia, Affghanistan, India. Annual.
Spermacoce hispida,	Eastern tropical Asia. Annual.
Statice cylindrifolia,	Arabia.
Vogelia indica,	Arabia, north-west India. Represented in Socotra by an endemic variety. Genus referred to on page lx.
Cuscuta chinensis,	From Syria eastwards to China ; also Australia. Annual.
Solanum gracilipes,	Arabia ? Beloochistan, north-west India.
Schweinfurthia pedicellata,	Arabia (Aden). Tritypic genus ; another species occurs in Arabia and Nile-land, and the third in Persia and Scindh.
Cistanche tubulosa,	From Arabia eastwards to northern India.
Orthosiphon tenuiflorus,	Arabia. Annual.
,, pallidus,	From Arabia eastwards to India. Annual.
Leucas lanata,	Indian Peninsula.
Psilostachys sericea,	Eastern India (Goozerat). Annual.
Atriplex Stocksii,	Persia, Beloochistan, Scindh.
Flüggea Leucopyrus,	Tropical Asia.
Pouzolzia auriculata,	Indian Peninsula, Ceylon.
Lagarosiphon Roxburghii,	Eastern tropical Asia.
Cyanotis cristata,	Eastern tropical Asia and Mauritius.
Pappophorum elegans,	India.
Eragrostis orientalis,	Tropical Asia.

All the species from the island fall into the categories above mentioned, save half-a-dozen species—*Cleome tenella, Hibiscus Solandra, Tillœa pentandra, Cyperus intermedius, C. Tegetum,* and *C. tenuiflorus*—which are plants of tropical Africa and of the Indian Peninsula, but are not reported from the intermediate districts in Asia ; two species of *Peperomia, P. Goudotii* from Bourbon and *P. arabica,* recorded from the Cape of Good Hope, Madagascar,

and Arabia; and twenty-three plants belonging to the following genera, of which our material is not adequate for a more precise determination:—

Farsetia, sp.	Entada, sp.	Ehretia, sp.
Hibiscus, sp.	Acacia, sp.	Plectranthus, sp.
Boswellia, sp. 2.	Euclea, sp. 2.	Aristolochia, sp.
Balsamodendron, sp. 2.	Ectadiopsis, sp.	Loranthus, sp.
Allophylus, sp.	Sarcostemma, sp. 2.	Thesidium, sp.
Erythrina, sp.	Boucerosia, sp. 2.	Ficus, sp.

It is probable that several of these imperfectly determined plants are endemic.

We have 253 species of Cryptogams from the island, Lichens forming a little more than half of the number. The distribution of the species amongst the several groups is shown in the table on page xxxvi.

If we have to consider the statistical analysis of the phanerogamic flora as only approximative, the same holds good, with increased force, for the Cryptogams. Less is known of the cryptogamic than of the phanerogamic flora of the adjacent mainlands, and the limitations of many genera and species in the Thallophyta especially, are admittedly so loosely defined at the present time that these afford an unsatisfactory basis for comparison; and then our collection of Cellular Cryptogams is even more fragmentary than that of Phanerogams, Lichens being the only group of which we have at all a representative gathering. I can only then write a brief account of the general features of the cryptogamic flora.

The position of Socotra prepares us for just such a cryptogamic flora as we know from the island. The large expanses of limestone, and the dry soil and climate of the greater part of the island, are not favourable to a development of luxuriant Ferns or delicate Muscineæ, and the only group of Cryptogams to which the conditions are at all suited is that of Lichens. The few Ferns that do grow on the island are mostly those which affect dry localities, and are found, like *Cheilanthes farinosa* or *Onychium melanolepis*, hidden under boulders, or, like *Actinopteris dichotoma*, occupying cavities in rocks on the hill-sides. *Ceratopteris thalictroides* banks the streams on Hadibu plain; whilst some, like *Pellæa concolor*, occur at a high altitude on the Haghier hills, where the climate is moister and more temperate. The Mosses and Liverworts are chiefly found upon the central granitic hills, high above the dry limestone-plains, though some, like *Weisia socotrana* and *Fimbriaria pusilla*, grow in the lower arid districts. Lichens grow in great numbers all over the island, and, as we know them, far outnumber all other Cryptogams. There is a marked absence of foliaceous and fruticose forms, by far the larger number being crustaceous. They colour the rocks in all localities, the prevailing tone being greyish-white, derived from species of *Roccella*, *Pertusaria*, and *Parmelia*; the stems of many of the trees have also coatings of *Opegrapha*, *Graphina*, and species of other genera. Other Fungi are not abundant, although doubtless a

more plentiful crop of Microfungi could be obtained. For Algæ I have already remarked the shore is not favourable, and we did not devote any time to its exploration. In the streams and pools of the island a small collection of Algæ and allied forms was obtained, but I do not think a rich harvest is to be gathered.

Of the nineteen species of Vascular Cryptogams, one is a hydropterideous species of India and west Africa; the rest are Ferns. Eleven of these are cosmopolitan in their range in the tropics, some of them being cosmopolitan in its most extended sense, and two are widely spread in the old world. Three have a restricted old-world distribution, and support the facts of distribution I have noticed in the case of the Phanerogams; thus, *Onychium melanolepis* belongs to the group of plants having its centre of distribution in north-east Africa and south-west Asia, but it does not range beyond this region, being confined to Abyssinia, Arabia, and Persia; and *Pellæa viridis* and *Gymnogramme cordata* are both African forms which do not reach Asia, the former extending into the adjacent tropical islands; whilst the latter has a more sporadic geographical area, occurring in south Africa, Angola, and Bourbon. Two species are endemic—*Adiantum Balfourii* and *Asplenium Schweinfurthii.*

Sixteen species of Musci and Hepaticæ are known—eleven being Musci and five Hepaticæ. Six of the former and two of the latter are endemic. Mr Mitten says of them that, in point of affinity, they "approach more nearly to the Indian flora than, so far as is yet known, to the African."

Characeæ, of which three members occur on the island, is interesting, because one of the species—*Chara socotrensis*—is endemic, and is a form connecting two hitherto well-defined sections of the genus.

The 130 species of Lichens, of which sixty-nine, or more than one half, are endemic, fall into forty-seven genera. A fourth of the species are distributed in warmer regions of the world, whilst another fourth includes species extending to Europe.

Of the twenty-seven representatives of other groups of Fungi, eleven are endemic. A large proportion of these are Microfungi. None of them call for special mention. Algæ and allied groups number fifty-eight species, only two of them being endemic; most of the plants have a very wide distribution; a few of the seaweeds are more local; but there is no point of particular interest to note.

I have in the preceding pages so fully exposed in tabular form the features of the flora of Socotra, that the nature of its elements and its relations require no further exposition, and the following summary of its characters, based upon the facts that have been already set forth, may be given.

1. The flora is an insular one, having

   a. Relatively large proportion of orders to genera, and of genera to species.

   b. Relatively large proportion of endemic species, and of endemic genera, and with a considerable amount of endemic variation.

   c. Small proportion of endemic annuals.

In support of this statement the tables on pages xxxvi, xl, and xlix, may be referred to.

2. It is that of a continental island, by which is meant that its features are evidently most nearly related to those of the adjacent continents, with which the island has undoubtedly been connected.

The tables on pages xlix, lvi, lxiii, lxvi, and lxvii, bear out this statement.

3. It has features of great antiquity.

For evidence of this statement we depend not only upon the character of the flora as a whole, but also upon the peculiar physiognomy of many endemic forms, and their isolation in the groups to which they belong. *Cocculus Balfourii, Nirarathamnos socotrana, Dracœna Cinnabari, Dendrosicyos socotrana, Dorstenia gigas,* and the like are all individual forms which betoken a remote ancestry.

4. It contains three conspicuous types of vegetation.

   a. One characteristic of a dry desert-region, in which, too, tropical, sub-tropical, and even sub-temperate forms mingle.

   b. One with a general tropical facies.

   c. One having the imprint of that in a cooler and more temperate climate.

On page xxxiv I have pointed out the prevalence on the plains of many plants having the aspect belonging to *a*, and on page xxxv I have noted the presence of some forms which answer the description of those included in *b* and *c*.

5. There is a large admixture of introduced plants, a considerable proportion of which are now quite naturalised. Many of them are annuals.

This is a feature that the tables on pages lxii and lxiii specially illustrate, and it is one which was to be expected in an island with so long a history of occupation by man.

6. Its affinities are essentially tropical African and Asian, being most pronounced with the flora of the regions immediately adjoining, i.e., with north-east Africa and south-west Asia; but the African element predominates.

(A) In the African element we find

   a. Forms which belong to those types which people the plain-regions of north-east and tropical Africa, extending to north Africa

and the warm regions of the Mediterranean region, and reaching even the Atlantic Islands.

b. Forms which are part of the general tropical African flora.

c. Forms which are met with on the African continent in the mountainous region of Abyssinia, of east tropical Africa, and of west tropical Africa, in south Africa, and also in Madagascar. This is the element which is developed chiefly, though not altogether, in the higher regions of the island.

(B) In the Asian element we find

a. Forms which belong to those types which people the plains of south-west Asia, extending as far as north-west India on the east.

b. Forms which are part of the general tropical Asian flora.

c. Forms which have relations in restricted districts in India or further east, but which have no connections in the intermediate regions.

7. There are some curious Mascarene connections. Thus, for instance, the occurrence of *Elæocarpus* and of *Cylista scariosa*.

8. There are some striking American affinities. *Thamnosma*, *Dirachma*, *Cœlocarpus* illustrate these.

How are these features to be explained? What is the origin of the Socotran flora?

When we group together all the facts now known of the flora, we arrive without hesitation at the conclusion that it has been isolated for a vast length of time during which Socotra has been an island. The position which Socotra occupies in the Indian Ocean naturally leads to the supposition that it has at one time been a portion of the African continent, and that it has been broken off from Cape Guardafui. The general evidence of the flora not only gives certainty to the supposition, but it also shows that the separation from the mainland is of great antiquity.

It is by such a land-connection alone that we can account for the African element in the flora. But, as I have shown, there are African elements of more than one kind in the Socotran flora. Beside the general tropical African types, we have those kinships with forms of sporadic African distribution of many of the most peculiar plants of Socotra to which attention has been repeatedly called, and some further explanation is needed to show what is the meaning of this relationship, and how it is come about that we have this group of isolated forms in the midst of others of more generally extended distribution.

All the evidence tends to show that the present general tropical flora of Africa is not the oldest African flora of which we have knowledge. The

specialised type and ancient character of the flora of south Africa, and its relations and similarities with types found at widely separated spots upon the highlands of the east coast of Africa, especially about Angola, the Cameroon mountains, and Fernando Po, in some of the Atlantic islands, in the north-west of Africa and south-west of Europe, as well in the highlands of east tropical Africa and Abyssinia, all point to the hypothesis which was first enunciated by Sir Joseph Hooker, that the south African flora has been continued along the highlands of east Africa and Abyssinia, and that a like connection existed through central Africa, between the western and north-east regions. That at a time when the tropical zone was much cooler than it now is, northern forms of plant-life spread as far as and over south Africa. With the diminution of the cold, these forms were driven back, and retreated northwards and up the mountains before the advance of a vegetation more tropical in its character, and a few types left on the isolated higher points of land in the regions mentioned, are at the present day the only evidence of the existence of this ancient flora, and of the invasion by what we now call the tropical African flora.

If we accept this hypothesis, then, in *Helichrysum, Babiana, Hæmanthus, Dracœna, Begonia,* and other Socotran plants with like kinship, we have an outlying fragment of this old African flora, its north-eastern limit, just as in southern latitudes we have its eastern limit in Madagascar and in the Mascarene Islands; and we learn further, that at a time when this old African flora peopled the land Socotra was yet a part of the continent, and the northward extension of some of the types, for instance, *Euryops*, into Arabia seems to show that Africa was then also joined in the north-eastern region with Asia. Whether the land-connection with Africa persisted during the time of and the expulsion of the older flora, so that the invading forms could spread directly over the land-surface, which is now Socotra, or a separation of the island took place during the reign of the old flora, it is not easy to decide. I am disposed to believe that there was insulation before the incoming of the new tropical forms, and that only at a later period, when land-connection with Africa was again established, did the general tropical African flora spread its influence before the final separation of the Socotra of to-day.

But if a land-connection with Africa is necessary for an adequate explanation of the African affinities, a like union with Asia must be assumed in order to account for Asian relationships. I have incidentally mentioned that the extension of some of the old African types into Arabia may be attributed to the period of the old African flora, when Socotra was part of the African continent. Any elevation of the land which would unite Socotra with Africa would bridge over the Straits of Bab-el-Mandeb, and a further elevation would bring Socotra

itself in union with Arabia. That some such connection has existed it is impossible to doubt, and by it the vegetation of the Orient gained extension into Socotra.

But there are those other Asian forms which do not occur anywhere in south-west Asia to account for—Indian and other Eastern affinities. How did they reach Socotra? An elevation of land that would unite Socotra and Madagascar with Africa—an elevation which certainly took place—would, if increased and continued over a wider area, produce some interesting changes in surface features. Not only would the Gulf of Aden disappear by the union of Africa with Arabia, but there would be no Persian Gulf, and the Euphrates would pour its waters through a delta extending over a large part of the Arabian Sea, and through this delta the Indus would also discharge, the coast-line of the Indian Peninsula being advanced to some extent. South of the equator Madagascar would join the Seychelles, which in turn, through the Malha and Nazareth banks, would run into the larger Mascarene Islands. In this way, then, Africa would have an irregular coast-line prolonged greatly south of the equator into the Indian Ocean, and running up with an advance upon its present line until it reached its north-eastern limit outside and south of Socotra. Thence an advanced land-surface of Asia would extend across the Arabian Sea into the Indian Peninsula. It appears to me that we must assume that some such land-surface as this existed to aid us in explaining the migration westward to Socotra of Indo-Malayan types, several of which have a striking extension into Madagascar and the Mascarene Islands. Lieutenant-Colonel Godwin-Austen asserts that the relationship of the Socotran land-shells are such as to warrant the conclusion of a prolongation of land-surface which would stretch from Madagascar to Ceylon across the Indian Ocean. Professor Von Martens questions this conclusion, and the evidence upon which it rests, and Dr Schweinfurth is also inclined to doubt a near connection with Madagascar. Mr Blandford, too, doubts the nativity of a lizard in Madagascar, because it is now found in Socotra, from which I gather that he would not allow a land-connection between Socotra and Madagascar. But the evidence from the plants leaves no room for questioning the determinations and spontaneity of forms, and the Madagascar and Mascarene affinities are thoroughly assured, as are those with India and the East. I do not think it is requisite to suppose so large a land-surface to have existed as Lieutenant-Colonel Godwin-Austen assumes, but a greater extension of land, and on the lines above sketched, appears to me to be required by the facts. I imagine that these Indian and Madagascar and Mascarene types were enabled to reach the land-surface, now Socotra, about the period when the old African flora existed, and they help one to the conclusion that a separation from Africa and Asia took place when that old flora was general in Africa, and then they, with the remnants of that flora, formed a conspicuous part of

the small colony of plant-life on the Haghier Peaks, which probably were then the only Socotran surface exposed. With the rising again of the land, and a renewed connection with Africa and also with Asia, the union was of much less extent, but of sufficient duration to allow of the inroad of a crowd of north-east African and south-west Asian forms.

We have, finally, to consider American affinities. The occurrence in Indian Ocean islands of restricted new-world types, or of forms related to these, is a remarkable and well-known fact of distribution. We have, for example, the sapotaceous *Labourdonnaisia* represented in Natal, Mascarene Islands, and Cuba; the laurineous *Ocotea* with representatives in Canary Islands, South Africa, and Madagascar, its main distribution being American; and the Rodriguesian *Mathurina*, one of the Turneraceæ, with its nearest ally the central American *Erblichia*. And now in Socotra we have similar relationships manifested. I need only mention *Thamnosma*, *Dirachma*, and *Cœlocarpus*. That the identity of form means identity of stock is, I think, in many of these cases an irresistible conclusion, but how the present distribution came about, whether by migration from the south and west or from the north and east, is one of those problems for which we have not yet the material for a solution.

Such is the account of the characters and of the origin of the flora of Socotra which I have the honour to submit to the Fellows of the Society.

On page xxiii I have quoted the words of Professor Bonney, in which he gives his conclusions regarding the mutations of Socotra, based upon the geological evidence, and it will be seen that the botanical evidence entirely corroborates them. The zoological evidence is too imperfect to allow of historical deductions being drawn from it, but in its several parts, as stated by the zoologists whom I have quoted, it does not run counter to the evidence of the plants.

Dealing with the whole facts that are at command, I may give this brief outline sketch of the geological and biological history of the island. During the carboniferous epoch there was in the region of Socotra a shallow sea in which was deposited on the top of the fundamental gneisses of this spot, which had ere then been certainly much seamed and fractured by volcanic outbursts, the sandstone of which we have such a large development in Nubia. This sea subsequently deepened, allowing the formation of the shales, which now constitute the argillite of the island. During the permian, Socotra may have been a land-surface, forming part of the great mass of land which probably existed in the region at that epoch, and gave the wide area for westward migration of life which presently took place, and by which the eastern affinities in Socotra may be explained. In early and middle tertiary times, when the Indian Peninsula was an island, and the sea which stretched into Europe washed the base of the Himalayan hills, Socotra was in great part submerged, and the great mass of its

limestone was deposited; but its higher peaks were still above water, and formed an island, peopled mainly by African species—the plants being the fragmentary remains of the old African flora—but with an admixture of eastern and other Asian forms. Thereafter it gradually rose, undergoing violent volcanic disturbance, and again became part of the mainland, though it is likely for only a short period, and during this union the life of the adjacent continent covered its plains and filled its valleys. Subsequently it reverted to its insular condition, in which state it has remained.

An island certainly from tertiary times, the various denuding agents have during the interval continued to sculpture the surface of Socotra, and have brought about the quaint outline we see at the present day; but as a land-surface it dates from a far greater antiquity, back indeed to the permian epoch; and the species which now people its surface exhibit peculiarities which bear alike the stamp of their ancient origin and the imprint of the isolation to which they have been subjected.

BOTANY OF SOCOTRA.

PHANEROGAMÆ ANGIOSPERMÆ.

DICOTYLEDONES.

POLYPETALÆ.

Order I. MENISPERMACEÆ.

A considerable tropical order of, with but few exceptions, climbing plants, occurring in both the old and new worlds. A few species are found in the cooler regions of North America, Eastern Asia, South Africa, and Australia.

COCCULUS.

Cocculus, DC. Syst. Veg. i. 515; Benth. et Hook. Gen. Pl. i. 36.

A small genus of about twelve species, chiefly growing in tropical Africa and Asia, though two species belong to the warmer parts of North America. All climbers except two species, of which one is endemic in Socotra.

1. C. Leæba, DC. Syst. Veg. i. 529; Oliv. Flor. Trop. Afr. i. 44; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 102.

Adenodicton phyllanthoides, Fenzl. in Flora 1844, 312.

Socotra. Not uncommon on the hill slopes. B.C.S. nn. 326, 340, 621, 632. Schweinf. n. 713.

Distrib. Tropical and subtropical Africa to the Cape de Verde Islands, and through Arabia to Afghanistan and India.

2. C. Balfourii, Schweinf. in Proc. Roy. Soc. Edin. xi. (1882), 500. Tab. I.

Dumetosus, cladodiferus, spinosus; foliis elliptico-oblongis v. subobovatis breviter petiolatis mox deciduis; floribus subsessilibus in brevissime-pedunculatas cymas confertis; fl. ♀:—staminodiis senis.

Frutex dense virgatus lignosus dumetosus cum ramis foliosis et cladodiis; rami juveniles foliosi elongati quadranguli, seniores subteretes angulati v. compressi et sæpe demum spinosi striati cano-pubescentes v. canescentes primum cladodiferi cladodiis extra-axillaribus folia superpositis deinde ex axillis infra cladodia duos (rarius unicum) superpositos foliosos ramulos emittentes; cladodia falcata rigida lignosa pubescentia striata apice spinosa 1½–3¼ poll. longa ⅕–⅔ poll. lata irregulariter a latere margineve ramosa semperque cladodia ne ramos foliosos gerentia. *Folia* vera ⅖–⅔ poll. longa ¼–⅛ poll. lata breviter petiolata mox decidua elliptico-oblonga v. subobovata sæpe obliqua, apice truncata v. retusa apiculata, margine revoluta, coriacea nitida nervis pilis adpressis subtiliter instructis, petiolo 1/12 poll. longo: folia cladodalia minuta inconspicua decidua. *Flores* a cladodiis rariùs a ramis incerte orientes subsessiles in fasciculos parvos conferti. *Bracteæ* minutæ squamiformes pilosæ. *Flos* ♀ ut in genere. *Flos* ♀:—*Staminodia* 6 petalis breviora. *Styli* reflexi. *Drupæ* reniformes subglabræ dorsaliter transverse rugosæ ⅕ poll. longæ; endocarpium lignosum.

Nom. Vern. Kiomhan. (B.C.S.)

Socotra. Abundant on the Haghier hills at an elevation of over 2000 feet. B.C.S. n. 439. Schweinf. n. 754.

Distrib. Endemic.

One of the most remarkable discoveries of our expedition. When first I obtained it, with neither flower nor fruit, on the top of Sicante, south from Tamarida, I took it to be a plant of a Gymnospermous type. Subsequently I gathered it plentifully, in flower only, near Adho Dimellus pass, but was unable to determine its affinity, and it was with considerable surprise I made it out, on examination in this country, to be a Menisperm. Its exact position seemed doubtful, and I was inclined to make it the type of a new genus. Fortunately Schweinfurth obtained a quantity of fruit, and has thus been able to refer it to the genus Cocculus, and his nomenclature is retained.

It is a strange species. *C. laurifolius*, DC. (Prod. i. 100), a plant of India and the Eastern Archipelago, is the only arboreous form known in the family, and, with the exception of a few low herbaceous Cissampeli, all the other species are climbers. But in our Socotran plant we have a hard-wooded shrub, growing, as a dense thicket, like our common gorse, and forming with its sharp-pointed cladodes a complete *chevaux de frise*.

The floral and fruit characters admit of no doubt as to its true position in this genus.

Possessing both cladodes and ordinary leafy branches, an interesting feature in the morphology of the plant is the succession of these. Young branchlets bear cladodes only, and these do not arise in the axils of the leaves, but at a little distance above, and at a later period, in the second or third year of growth,

the axillant leafy shoot is developed below the cladode. Usually two superposed leafy shoots arise and develope equally. The branching of the cladodes is most irregular, as is the production of flowers.

The internal anatomy of the plant is interesting, and conforms with the characteristics of other Menisperms. I shall refer to this subject at greater length in the appendix.

Schweinfurth directs attention to the resemblance between this plant and the South American *Colletia cruciata*, Hook. & Arn., a rhamnaceous plant not unfamiliar in cultivation. The morphological likeness is very striking, and I find the same succession of cladodes and leafy branches. Mr N. E. Brown of Kew Herbarium points out that in the aphyllous section of the Australian leguminous genus Daviesia similar features are found.

Order II. PAPAVERACEÆ.

A family of herbaceous plants of temperate and subtropical regions, containing several species which are widely spread as weeds of cultivation.

ARGEMONE.

Argemone, Linn. Gen. n. 649; Benth. et Hook. Gen. Pl. i. 52.

An American genus of six species, one of which, the following, is found almost everywhere in the tropics as an introduced weed.

A. mexicana, Linn. Sp. 727; DC. Prod. i. 120; Oliv. Flor. Trop. Afr. i. 54; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 117; Bot. Mag. t. 243.

Nom. Vern. Maruna. (B.C.S.)

Socotra. In the vicinity of Tamarida. B.C.S. n. 454.

Distrib. Widely spread in the tropics.

Order III. CRUCIFERÆ.

A very large order of herbs and rarely half-shrubby plants, most abundant in the temperate and cold regions of the northern hemisphere; rare within the tropics. Of the five genera represented in Socotra, one is endemic, one has a limited Persian and Somali Land distribution, a third is confined to the dry plains of the old world tropics, the remaining two having a more extended range in the old world.

1. DICERATELLA.

Diceratella, Boiss. Diagn. v. 80 (olim *Diceratium*, Boiss.); Benth. et Hook. Gen. Pl. i. 71.

A genus made up of three species of white and downy herbs, two of which have a limited distribution on the desert plains of Persia, and the third is

known only from Socotra and Somali Land. The genus is very closely allied to Robert Brown's *Notoceras* from the Canary Islands, Mediterranean region and Western Asia, from which indeed it is but doubtfully separated by th more clothed habit and the colour of its flowers.

D. incana, Balf. fil. in Proc. Roy. Soc. Edin. ix. (1882), 500. Tab. II.

Notoceras sinuata, Franch. Sert. Somal. in Miss. Révoil. 9.

Herba incana; foliis oblongis v. ovatis, obtusis, repandis; racemis laxis elongatis; floribus magnis; siliquis tetragonis.

Erecta basi suffruticosa incana. *Folia* oblonga v. ovata ¾–1¼ poll. longa, ⅓–½ poll. lata, basi cuneata in petiolum brevem attenuata, apice obtusa v. subacuta, repanda dentata v. dentato-serrata, subfloccosa. *Racemi* laxi elongati sæpe pedales. *Alabastri* oblongi. *Flores* magni ⅝ poll. longi. *Sepala* margine scariosa, lateralia basi saccata. *Petala* erythrina dimidio sepala superantia. *Siliqua* tetragona vix torulosa ⅝–¾ poll. longa floccosa, cornuis stylo dimidio longioribus.

Socotra. On sandy spots of the plains about Galonsir. B.C.S. nn. 136, 161.

Distrib. Somali Land.

A very beautiful new species of this genus, of which *D. floccosa*, Boiss. (Flor. Orient. i. 315), and *D. canescens*, Boiss. (*loc. cit.*) are the other members. These were brought from Persia by Aucher Eloy.

The Socotran plant is very distinct, resembling most *D. floccosa*, from which, however, its larger leaves, long lax racemes, large flowers with saccate lateral sepals, as also its tetragonous siliqua separate it. These last two characters are points in which the species varies from the generic type as given by Bentham and Hooker (*loc. cit.*), where I find "sepala basi æqualia" "siliqua teretiuscula torulosa." The specimens of Boissier's species to which I have had access are somewhat fragmentary, and do not afford flowers for making a satisfactory comparison, but the fruit of *D. canescens*, which is described by him as subtetragonous, shows an approach to the marked tetragonous condition which is so conspicuous a feature in the Socotran plant.

Franchet, ignorant of my diagnosis of the species as found in Socotra, described (*loc. cit.*) Révoil's Somali Land specimens under the genus *Notoceras*. I have in Paris, through the kindness of M. Franchet, examined Révoil's plant, and find it is the same as the Socotran one.

2. FARSETIA.

Farsetia, Desv. Journ. Bot. iii. (1814), 173; Benth. et Hook. Gen. Pl. i. 72.

A genus of about twenty-five species of whitish woolly herbs or half-shrubby plants, characteristic of the dry plains of the circum-Mediterranean region, Arabia, Persia, and north-west India. One species appears endemic in Socotra.

1. **F. longisiliqua**, Dcne. in Ann. Sc. Nat. sér. 2, iv. (1835), 69; Boiss. Flor. Orient. i. 157; Oliv. Flor. Trop. Afr. i. 62; Fourn. in Bull. Soc. Bot. de France xi. (1864), 56.

F. stylosa, T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 1.
Matthiola stylosa, Hochst. et Steud. in herb. Schimp. Arab. sect. i. n. 860.

Socótra. Common on the limestone plains. B.C.S. n. 584. Schweinf. n. 224.

Distrib. Arabia, Nubia.

Decaisne first briefly described this species thus:—"ramis foliisque incanis, siliquis pedunculatis cernuis linearibus (2 poll. longis, 2½ lin. latis),"—from imperfect specimens collected by Bové on the plains of Yemen. T. Anderson, when he wrote his florula of Aden, had not seen Decaisne's plant, but on the strength of a remark by Walpers (Repert. i. 139) regarding it, "non hujus generis esse videtur," he made of the Aden plant a new species. Oliver (*loc. cit.*) describes the species, adding "I have not seen type specimens of this plant; the name is taken from Schweinfurth's Nubian distribution. It appears doubtfully distinct from *F. Hamiltonii*, Royle Illustr. 71."

A type specimen is now in Kew Herbarium and, though it is imperfect, enables me to determine that Decaisne's species is a good one. From *F. Hamiltonii*, Royle, it is distinguished by its much larger flowers, pods, and non-capitate stigmas.

F. linearis, Dcne., another African species, which Hooker and Thomson (in Hook. Flor. Brit. Ind. i. 140), consider identical with *F. Hamiltonii*, Royle—(I cannot agree with them, but with Fournier regard it as a distinct species, recognisable by the longer, not capitate but bifid style and more slender stigma)—is also separated from *F. longisiliqua*, with which it has close affinity, by its smaller flowers and shorter and relatively broader pods,—characters which T. Anderson also recognised as specific. A plant in Kew Herbarium marked "*F. heliophila*, Bunge (Iter Persicum)" seems to me doubtfully distinct from our plant.

The Socotran specimens are remarkable for their very large flowers. These sometimes attain a length of over ¾ of an inch. The plant is very common on the plains, especially about Galonsir. Schweinfurth marks his specimens "fl. livido." I found flowers varying in colour from a pink to that livid or violet shade seen in, for example, the common *Malcolmia maritima*.

2. **F. prostrata**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 500.

Herba prostrata; foliis obovatis obtusis sæpe apiculatis crassis strigosis; siliquis linearibus.

Prostrata lignosa ramis cinereis pilis adpressis dense vestitis. *Folia* obovata obtusa sæpe apiculata crassa strigosa ¾–1¼ poll. longa ⅕–⅓ poll. lata. *Alabastri* oblongi. *Flores* breviter pedicellati. *Sepala* lineari-acuta strigosa. *Petala* dimidio calycem superantia. *Stylus* bifidus. *Siliqua* linearis ½ poll. longa ⅛ poll. lata; stylum in fructu non vidi. *Semina* uniseriata compressa alata.

Socotra. On the plains about Galonsir, not common. B.C.S. n. 205.

Distrib. Endemic.

Of this plant I have only one specimen, and that not a good one. It bears, however, a flower and two pods. The characters derived from these and from the leaves prevent the plant being incorporated in any described species. The association of a linear pod with broad leaves is not commonly met with in the genus.

3. Farsetia, Sp.

Socotra. B.C.S. n. 586.

A few fragments of inflorescence bearing flowers and one or two fruits of a species of this genus are in our collection. There are no leaves with the inflorescences, and as they turned up in a small packet containing delicate flowers and fruits of plants, complete specimens of which are in our collection, I suppose they have been dried in the belief that they belonged to one of the two species already mentioned. They are marked as collected near Galonsir, but I have no recollection of gathering them, and they do not belong to either species. The flowers are small, about the size of those of *F. linearis*, Dcne., but the style is much longer ($\frac{3}{4}$ in.) than in that species, more tapered and more deeply bifid, and with the lobes connivent. The pod is about an inch long, and the valves are finely reticulate-venulose and hardly strigose. I have not been able to refer them to any described species.

3. SISYMBRIUM.

Sisymbrium, Linn. Gen. n. 813; Benth. et Hook. Gen. Pl. i. 77.

A large genus of mainly European and Eastern Asiatic distribution, but represented in most temperate regions. Very few species occur in the southern hemisphere.

S. erysimoides, Desf. Fl. Atl. ii. 84. t. 158; DC. Syst. Veg. ii. 482; Boiss. Flor. Orient. i. 217; Oliv. Flor. Trop. Afr. i. 64; Fourn. Monogr. Crucif. 92.

Socotra. An occasional weed. B.C.S. n. 700. Schweinf. n. 508.

Distrib. A plant of the Mediterranean region, and found also in Canary Islands, Abyssinia, Arabia, and southern Persia.

4. BRASSICA.

Brassica, Linn. Gen. n. 820; Benth. et Hook. Gen. Pl. i. 84.

A considerable genus of badly defined species, distributed in the temperate regions of the northern hemisphere of the old world. A few occur at the Cape.

B. rostrata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 500.

Herba annua; foliis lyrato-pinnatisectis; floribus albis; siliquis patentibus torulosis, valvis trinerviis, rostro longo monospermo.

Glabra v. puberula nunc hirsuta. *Folia* 3–3½ poll. longa lyrato-pinnatisecta segmento terminali obcuneato-trilobato, caulinia rarius integra lineari-lanceolata apiculata, inferiora segmentis sæpe ¾ poll. longis oblongis v. subrotundatis obtusis subcrenatis interdum dentatis, superiora segmentis ovatis v. lanceolatis acutis dentatis; petiolus 1–2 poll. longus. *Flores* albi. *Sepala* patula. *Siliqua* subcompressa ⅖–⅘ poll. longa, longe graciliterque pedicellata (pedicellis ⅖–⅘ poll. longis) patentia torulosa, valvis trinerviis rostroque conico basi monospermo dimidio breviore v. subequilongo suffultis. *Semina* ellipsoidea.

Socotra. Abundant on the hill slopes up to a great elevation. Most frequently in sheltered spots under cliffs or boulders. B.C.S. n. 245.

Distrib. Endemic.

Of Eastern species, *B. Tournefortii*, Gouan (Ill. 44, t. 20A), a form with a considerable distribution, extending on the Mediterranean shores as far west as Spain, and reaching to Persia and northern India, has most resemblance with the Socotran plant. With *B. fruticulosa*, Cyr. (Pl. Rar. ii. 7, t. 1), a plant of Oran and the Mediterranean basin, our plant has also close affinity. From both its foliage, white flowers with spreading sepals, and three-nerved valves to the pods, distinguish it, whilst from the last-mentioned species the additional character of the long strong beak to the pods is diagnostic.

This is a species that varies much in clothing. Typically almost glabrous, it passes through more or less puberulous states, until it is at times quite hirsute. With the hirsute condition is associated in the specimens gathered a more pronounced dentation or serration of the leaf segments. When these characters are fully developed, one might designate the form a variety as,—

B. rostrata, Balf. fil. var. **hirsuta**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Omnino hirsuta foliisque arcte dentato-serratis.

Socotra. Not so common as the species. B.C.S. n. 555.

Distrib. Endemic.

5. LACHNOCAPSA.

Lachnocapsa, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 500.

Sepala erecta, lateralia basi saccata. Petala unguiculata. Stamina libera, edentula. Siliqua brevis, plano-compressa, subcordata v. orbicularis, tomentosa, subsessilis, foliis similissima, 2-locularis loculis interdum bilocellatis, 1–3-sperma; valvis sæpe septulatis, apteris, crassis, spongiosis, septo contrarie compressis; septum lineare, enervium, chartaceum; stylo prope nullo; stigmate bilobo. Semina in locellis solitaria, suspensa, oblonga, subcompressa, immarginata; testa nonmucosa; radicula incumbens.—Fruticulus diffusus, ramosus albide tomentosus, cortice rumpente decidenteque. Folia alterna integra. Flores axillares, subsessiles, lutei.

A monotypic endemic genus. It is a very distinct one, and remarkable by its shrubby habit and the downy cordate pods, which resemble so closely the leaves that is is difficult to distinguish them.

Its affinities are somewhat obscure. Angustiseptate pods with incumbent

radicle relegate it to the Lepidineæ, and possibly its nearest ally is to be found in Lepidium. But amongst the Isatidæ there are genera in the vicinity of Isatis itself which present these characters, though they always possess a well-marked winged, single seeded pod.

ETYM. λάχνος wool and κάψα, capsule.

L. spathulata, Balf. fil. *loc. cit.* Tab. III.

Folia spathulata oblique dense tomentoso-velutina $\frac{2}{3}$–$\frac{5}{8}$ poll. longa $\frac{1}{5}$–$\frac{1}{3}$ poll. lata. *Flores* magni $\frac{5}{12}$ poll. longi. *Petala* sepalis longiora. *Siliqua* $\frac{5}{12}$ poll. diam., basi thalamo bilobato cincta.

Socotra. On the sandy plains near Galonsir. B.C.S. n. 587.

DISTRIB. Endemic.

Order IV. CAPPARIDEÆ.

A large family containing twenty-three genera of shrubby or herbaceous plants, sometimes trees, inhabiting tropical and subtropical regions all round the world. Of the five Socotran genera, all are characteristic of dry and sandy localities. Two of them are almost entirely confined to such spots in tropical Africa, and south-west Asia, with the adjacent islands. The others are nearly cosmopolitan in the tropics.

1. CLEOME.

Cleome, Linn. Gen. n. 826; Benth. et Hook. Gen. Pl. i. 105.

A large genus of herbs or half shrubs spread in dry and sandy tropical and subtropical regions of both the old and new worlds. Of the five Socotran species, one is endemic, three are essentially inhabitants of the desert plains of south-west Asia and north-west Africa, but one exhibits a distinct variety in Socotra; the fifth is a common tropical weed.

1. Cl. papillosa, Steud. Nom. Bot. ed. 2. i. 382; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. i. 3; Boiss. Flor. Orient. i. 413; Oliv. Flor. Trop. Afr. i. 76; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 168.

Socotra. Near Tamarida. Schweinf. n. 275 in lit.

DISTRIB. Through Arabia and Scindh to north-west India, and in Nile Land.

I have seen no specimens of this plant from Socotra. Schweinfurth informs me in a letter that he has it.

2. Cl. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 501.

Herba erecta; foliolis obovatis v. oblongo-obovatis; petalorum limbo subdeltoideo; siliquis adscendentibus; seminibus pubescentibus.

Glanduloso-scabra 1–1½ ped. alta. *Folia* trifoliolata petiolata 1–1½ poll. longa; foliola ⅓–½ poll. longa vix ¼ poll. lata obovata v. oblongo-obovata glandulosa v. subglabra. *Racemi* longi. laxi terminales. *Bracteæ* inferiores trifoliolatæ petiolatæ, superiores simplices minutæ subsessiles. *Flores* pedicellati. *Sepala* lanceolata glandulosa. *Petala* sæpe inæqualia

unguiculata calyce duplolongiora, postica duo v. tria purpurea limbis subdeltoideis acutis *Stamina* 6 basi libera. *Stylus* brevis. *Siliqua* late oblongo-linearis ½–2 poll. longa ⅛–¼ poll. lata scabra venosa recta adscendens subsessilis. *Semina* pubescentia.

Socotra. Not uncommon. B.C.S. nn. 76, 404. Schweinf. nn. 659, 710.

Distrib. Endemic.

This plant I at first considered to be a form of *Cl. arabica*, Linn., a widespread North African and Arabian species. In habit the species resemble one another closely, and the likeness is especially marked in the Arabian forms of *Cl. arabica*. But the less scabrid character of the Socotran plant, its broader leaves, form of petals, straight ascending pods, and lastly, its smaller hairy not cottony seeds, sufficiently separate it. Schweinfurth sends two specimens of the plant, one of which n. 659 is almost as scabrid as *Cl. arabica*.

Like all Cleomes it is a somewhat variable plant according as it occurs on dry plains or in sheltered favourable situations. Sometimes in the latter habitats it is perfectly glabrous, and then the leaves are much larger than is normally the case.

3. **Cl. tenella**, Linn. fil. Suppl. 300; DC. Prod. i. 240; Oliv. Flor. Afr. i. 78; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 169.

Socotra. On the plains about Galonsir and Tamarida. B.C.S. n. 147. Schweinf. n. 749.

Distrib. Southern India and Tropical Africa.

The Socotran specimens resemble more the African than the Indian plants, the latter being, as Hooker and Thomson (*loc. cit.*) state, of smaller dimensions, though identical with that of Africa. The seeds are "globose reniform minutely rugulose pitted" (Oliv. *loc. cit.*) not "smooth" (Hook. fil. and Thoms. *loc. cit.*).

4. **Cl. brachycarpa**, Vahl. ex DC. Prod. i. 240; T. Anders. in Journ. Linn. Soc. v. (1880), Suppl. 4; Boiss. Flor. Orient. i. 412; Oliv. Flor. Trop. Afr. i. 77; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 169; Franch. Sert. Somal. in Miss. Révoil. 11.

C. Ruta, Jacqem. Voy. Bot. 19, t. 19.
C. moschata, Stocks ms. in Herb. Kew.

Socotra. Sandy parts of the limestone plains. B.C.S. nn. 88, 556. Schweinf. n. 262, in lit.

Distrib. Arabia to north-west India, and in Nile Land.

A very variable plant, both in size of leaf and in amount of glandular clothing. In Socotra it varies in this latter respect from densely glandulose to nearly glabrous.

Our specimens (n. 556), are from a plant of less scaberulous character than is typical, and of which the upper leaves of the flowering shoots are longly petioled, not sessile as in the type. There is no fruit on the specimen to confirm the identification, yet I have little doubt it is a form of this species. Schweinfurth sends specimens (n. 289), collected near Tamarida, which are quite glabrous, and he tickets them "Cleome aff. brachycarpa, sed habitu diversa et foliis non moschatis inodoris." In a note he remarks *Cl. brachycarpa* is "herba semper moschata, covered all over with short stalked glands." This plant has sessile glands on the fruit only, and though in structure the flowers are like those of *Cl. brachycarpa* yet they are smaller, the foliage is more minute, and the basal leaves are simple with long stalks. He concludes, however, that it may be merely a shade form of *Cl. brachycarpa*, but on account of its slender habit, inodorous character, and minute different foliage, deserving a varietal name, for which he proposes "filicaulis." Its diagnosis is,—

Cl. brachycarpa, Vahl, var. **filicaulis**, Schweinf. in Proc. Roy. Soc. Edin. xiii. (1883).

Minuta, eglandulosa, inodora, filicaulis.

Socotra. Near Tamarida. Schweinf. n. 289.
DISTRIB. Endemic.

5. Cl. viscosa, Linn. Sp. 938; Oliv. Flor. Trop. Afr. i. 80; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 170.

Polanisia viscosa, DC. Prod. i. 242.
P. icosandra, Wight Ic. t. 2.

Socotra. About villages, B.C.S. n. 681. Schweinf. n. 276, in lit.
DISTRIB. A common tropical weed.

2. GYNANDROPSIS.

Gynandropsis, DC. Prod. i. 237; Benth. et Hook. Gen. Pl. i. 106.

A small genus of herbaceous plants found in the tropics all round the world.

G. pentaphylla, DC. Prod. i. 238; Boiss. Flor. Orient. i. 410; Oliv. Flor. Trop. Afr. i. 82; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 171.

Cleome pentaphylla, Linn. Sp. 938; Bot. Mag. t. 1681.

Socotra. Casual about habitations. B.C.S. n. 206. Schweinf. n. 393.
DISTRIB. Common tropical weed.

3. MÆRUA.

Mœrua, Forsk. Fl. Ægypt. Arab. 104; Benth. et Hook. Gen. Pl. i. 108.

A small genus of shrubby plants or small trees found across tropical Africa, extending to the Cape; also spread eastwards through Arabia to India and in the islands of the Indian Ocean.

M. angolensis, DC. Prod. i. 254; Oliv. Flor. Trop. Afr. i. 87, var. **socotrana**, Schweinf. in Proc. Roy. Soc. Edin. xiii. (1883).

Arbor mediocris vel frutex ramis effuso-dependentibus dense foliosis; foliis tenuiter carnosulis vel (perennantibus) crassis suberosis, petiolo duplo vel ad ⅓ lamina breviore flaccido haud recurvo, lamina basi cuneata ovali-obovata v. oblongo-lineari ad apicem rotundata v. emarginata semper mucronata; floribus paucis mediocribus apetalis; fruct. ignot.

Nom. Vern. Eschäb. 'Eschab. Eshaib. (Wellst.)

Socotra. On the hills and plains, B.C.S. nn. 193, 588. Schweinf. nn. 251, 457, 603.

Distrib. Abyssinia?

Schweinfurth, whose description I have quoted above, thus writes:—"differt a M. angolensis Nubiæ et Africæ septentrionalis orientalis, in foliis creberrimis semper cuneatis nunquam acutis obsoletius nervosis, nervis secundariis basalibus ad marginem longius decurrentibus, petiolo apice minus incrassato nunquam inflexo, floribus plus duplominoribus 3–4 ad apices ramorum."

As found on Socotra by Schweinfurth, this plant is variable. He has three sets of specimens:—

α. n. 603. From the Wadi Digal, at an elevation of about 2500 feet. A lofty shrub with pendant branches. This is called Eschäb.

β. n. 457. From Keregnigiti. A weeping shrub with narrow leaves. No flowers found.

γ. n. 251. "From the plains at Galonsir. A small tree with pendant branches and long virgate polystichous fleshy leaves, in shape like those of n. 603, but with shorter petioles. On the young branches occur slender petioled thin leaves. This is called 'Eschab, in Arabic 'Seob,' a name applied on the shores of the Red Sea to *Mœrua uniflora*, Vahl, and perhaps to all Mæruas."

All these Schweinfurth regards as forms of one species, which he takes to be distinct from *M. angolensis*, DC.; but for the present he is content to describe them as a variety of that species, because without fruit a true diagnosis is impossible.

We obtained two Mæruas of different aspect on the island. One, (n. 588), not uncommon on the hills, is a weeping form, with leaves cuneate at the base, and corresponds with Schweinfurth's n. 603, (I agree with him in regarding his n. 603 as identical with n. 457.) Our other plant, (n. 193), is a small tree from the plains, with pendulous branches and close-set short-petioled fleshy

glaucous leaves, which are a favourite food with camels; and as the young twigs are so usually devoured, it is rare to find flower or fruit. This form I think may be the same as Schweinfurth's n. 251, although he mentions the leaves on young shoots as slender and long-petioled, whilst our plant is heterophyllous after the type of such Mascarene plants as *Pyrostria trilocularis*, Balf. fil. *Scyphochlamys revoluta*, Balf. fil., &c. (see Botany of Rodriguez in Phil. Trans. 168 (extra vol. 1879). The leaves on young shoots are long and linear, often 2 inches in length, and only $\frac{1}{12}$th inch broad, and subsessile, whilst the mature leaves are oblong, about $1\frac{1}{4}$th in. long, and shortly petiolate with a cuneate base. Is this, then, merely a plain form of the hill plant, or is it a distinct species?

M. angolensis, DC. is a wide-spread and variable plant, and as it occurs in Angola is a tree with leaves not narrowly cuneate at the base but rather obtuse and rounded. I have examined De Candolle's type, and also specimens collected by Welwitsch (n. 969)—which last show heterophylly of the same type as our Socotran plain form—and they are certainly different from our specimens. It may be questioned, however, whether the species as taken up and described by Oliver (*loc. cit.*) is really one or includes more than one form. The Abyssinian specimens in Kew Herbarium, under the name *M. retusa*, Hochst., quoted by Oliver as a synonym of *M. angolensis*, are I think doubtfully referable to it, and with them the Socotran hill plant agrees in many ways, especially in the cuneate based leaves, though ours is a more delicate plant and has smaller flowers with a relatively shorter calyx tube.

Whether there are one or two species on Socotra, and whether the Abyssinian plant is identical with any Socotran form, must remain for future exploration to decide. Meanwhile, as our specimens are not perfect, I have accepted Schweinfurth's description and nomenclature.

The Socotran tree is a very graceful one, and is thus described by Wellsted (Journ. Roy. Geogr. Soc. v. (1835) 199:—"The eshaib tree is remarkable as resembling in its light and graceful form the weeping ash of England. Notwithstanding the slender dimensions of its trunk, and its being always slightly inclined in a direction contrary to the prevailing south-westerly breezes, it appears to be capable of withstanding the full force of a tropical storm. From the great length of the petiole, the leaves hang loose, and are easily shaken by the wind, presenting an appearance similar to that produced by the "light quivering aspen." A more beautiful or tasteful mourner over an urn or tomb than this plant could not be selected!"

4. CADABA.

Cadaba, Forsk. Fl. Ægypt. Arab. 67; Benth. et Hook. Gen. Pl. i. 108.

A small genus of shrubs chiefly found in tropical Africa (but extending to the Cape), Arabia, India, and the islands of the Indian Ocean. One species

occurs in Australia. The name was derived by Forskål from the Arabic vernacular name for one of the species. Possibly the village Kadhab on the northern shores of Socotra takes its name from a species of the genus growing abundantly on the plain in its vicinity. Both Socotran species are plants of the dry sandy region of the vicinity of the Red Sea.

1. **C. rotundifolia**, Forsk. Fl. Ægypt. Arab. 68; DC. Prod. i. 244; Boiss. Flor. Orient. i. 418 (notul. ad spec. *C. glandulosa*, Forsk.); Oliv. Flor. Trop. Afr. i. 89.

C. glandulosa, var. *glabrior*, Thoms. ms. in Herb. Kew.
Strœmia rotundifolia, Vahl Symb. i. 20.

Socotra. On the hill slopes near Galonsir. B.C.S. n. 322.

Distrib. Nile Land.

The specimens from Socotra referred to this species have no flower, but they are identical with plants in Kew Herbarium, collected at Aden by Thomson, and named by him as a variety "*glabrior*" of *C. glandulosa*, Forsk. Oliver (*loc. cit.*) in a note to description of *C. glandulosa*, which is typically "glandular pilose with short spreading viscid hairs" and in such form occurs at Aden, referring to Thomson's Aden specimens, says,—"a slightly scabrid or nearly glabrous variety occurs at Aden."

An examination of Thomson's specimens, which have flower but no fruit, has convinced me that it is not a variety of *C. glandulosa*. In addition to the distinction derivable from the clothing, the very constant retuse form of the leaves, and above all the floral characters—filaments of stamens adnate to the gynophore through a considerable extent, and ovary one-celled with two opposite placentas—separate it from *C. glandulosa*, and bring it near *C. rotundifolia*, Forsk. I say bring it near this species, for the leaves in Thomson's as well as in our Socotran plants are considerably smaller (not exceeding $\frac{3}{4}$ inch in diameter), and have shorter petioles than those of Forskål's type from Arabia and Nile Land. Aden is one of the stations for the type *C. rotundifolia*. It was first found there in 1873, by Oliver and Cleave, and their specimens have been ticketed in Kew Herbarium as variety "*glabrior*" of *C. glandulosa*. We also found the type at Aden. But I have seen no specimens like those of Thomson brought by any other collector from Aden.

Although, then, the Socotran, and Thomson's Aden specimens do not conform exactly with the specific characters of either species, it appears to me that they are much more nearly allied to *C. rotundifolia* than to *C. glandulosa*, and I am indeed unable from the specimens to determine any good character by which to separate them from the former somewhat variable species. It may be, however, that we are dealing with a distinct species.

2. **C. longifolia**, DC. Prod. i. 244; Oliv. Flor. Trop. Afr. i. 90; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 4; Ach. Rich. Tent. Flor. Abyss. I. 26, t. 5.

Socotra. Not common on the plains. B.C.S. n. 679.

Distrib. Somali Land, Abyssinia, shores of the Red Sea. Common at Aden.

5. CAPPARIS.

Capparis, Linn. Gen. n. 643; Benth. et Hook. Gen. Pl. i. 108.

A large genus of trees or shrubs, often spiny, of tropical and warm regions in both old and new world, but absent from North America.

1. **C. aphylla**, Roth. Nov. Pl. Sp. 238; DC. Prod. i. 246; Oliv. Flor. Trop. Afr. i. 95; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 174; Brandis For. Flor. t. iii.

C. Sodada, R. Br. in Denh. and Clapp. App. 20; Boiss. Flor. Orient. i. 419.
Sodada decidua, Forsk. Fl. Ægypt. Arab. 81; Del. Fl. Ægypt. 74, t. 26, f. 2.

Socotra. A characteristic plant of the dry limestone plains at the east and west ends of the island. B.C.S. n. 678.

Distrib. Through Nile Land and north tropical Africa, and from Arabia to north-west India.

2. **C. spinosa**, Linn. Sp. 720; DC. Prod. i. 245; Boiss. Flor. Orient. i. 420; Oliv. Flor. Trop. Afr. i. 95; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 173.

Socotra. On the plains, common. B.C.S. n. 192. Schweinf. n. 751.

Distrib. Of wide distribution in the dry regions of the tropics.

The plant occurs in both spiny and unarmed states on Socotra. For a discussion of the synonymy of this protean species, see Hooker and Thomson (*loc. cit.*) and T. Anderson (in Linn. Soc. Journ. v. (1860), Suppl. 5). The Socotran plant is the true *C. spinosa*, Linn.

Order V. RESEDACEÆ.

A small family of six genera, reaching a maximum in the regions about the Mediterranean, and in south-west Asia. A few representatives extend to India and south Africa.

1. RESEDA.

Reseda, Linn. Gen. n. 608; Benth. et Hook. Gen. Pl. i. 112.

A genus of some twenty-seven species of very variable herbs or half-shrubs occurring in the circum-Mediterranean region, and the dry parts of south-west Asia.

R. viridis, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 501.

Fruticulosa, glaberrima; foliis ellipticis v. oblongis v. subobovatis obtusis sinuatis interdum tripartitis longe petiolatis; pedicellis floribus brevioribus; sepalis 6 integris deciduis; petalis albis; filamentis deciduis; capsulis breviter tridentatis; seminibus tuberculatis.

Suffrutex ramosus ramis late patentibus subdecumbentibus. *Folia* $1\frac{1}{4}$–$2\frac{1}{4}$ poll. longa $\frac{2}{3}$–1 poll. lata indivisa sed superiora rarius ternatim partita, lamina elliptica v. rotundato-obovata obtusa sæpe emarginata, basi in petiolum longuum usque ad pollicare cuneatim attenuata, margine sinuata. *Spicæ* longe conicæ; pedicelli $\frac{1}{8}$ poll. longi floribus breviores; bracteæ longe subulatæ caducæ. *Sepala* 6 anguste spathulata subæqualia $\frac{1}{8}$ poll. longa decidua petalis vix breviora. *Petalorum* superiorum lamina ad basim in 5 lacinias lineari-spathulatas subæquales ungui æquilongas partita. *Filamenta* decidua. *Capsula* glabra breviter tridentata, ore vix constricto, oblonga $\frac{3}{8}$ poll. longa; placentæ tenues indivisæ. *Semina* $\frac{1}{16}$ poll. diam. rugoso-tuberculata.

Socotra. On the slopes of the hills near Galonsir at, an elevation of 1500 feet. B.C.S. n. 230.

Distrib. Endemic.

This is a very graceful under-shrub, with a woody base and long spreading branches bearing leaves of an exquisite fresh green. Apparently a new species, it has very close affinities with Continental forms, and notably with *R. Aucheri*, Boiss. (Diagn. Ser. 1. i. 5), a plant of Mesopotamia, Persia, and Scindh. This species, to which *R. Alphonsi*, Müll. (in Bot. Zeit. 1856, 35) is referred, resembles our plant, especially through Algerian specimens, in habit and foliage, but the leaves are not so fleshy, are more distinctly veined and are usually acute (in Persian plants always so), the pedicels are longer and more delicate, and the capsules stouter and somewhat globose at the base; the seeds, too, are usually smooth, but sometimes are somewhat rugose punctate.

T. Anderson (in Journ. Linn. Soc. v. (1860), Suppl. 6) regards *R. Aucheri* as a form of the widely spread desert species *R. pruinosa*, Del., from which he distinguishes the Aden plant *R. amblyocarpa*, Fres. But, as Oliver (Flor. Trop. Afr. i. 103) points out, the punctate seeds of the Aden plant upon which Anderson rests his diagnosis are not sufficient to warrant its separation from *R. pruinosa*, in which the seeds are usually smooth, and Hooker fil. and Thomson (Hook. Flor. Brit. Ind. i. 181), rightly, I think, keep up *R. Aucheri* as distinct from *R. pruinosa* (with which they combine *R. bracteata*, Boiss.) on the ground of the general absence of pruinose character, rarely or less divided leaves, longly pedicellate flowers, and long linear bracts.

Even if all these forms be reduced to one species, the Socotran plant has in its pedicels, capsules, and seeds, characters quite sufficient to distinguish it specifically though it is not far removed from them.

Seeds of this plant sent home to Kew germinated, and in the autumn of 1880 the plants flowered.

2. OCHRADENUS.

Ochradenus, Del. Fl. Ægypt. 92, t. 31, f. 1; Benth. et Hook. Gen. Pl. i. 112.

A genus of two species of shrubs, one found in Spain, the other, which occurs in Socotra, extends from Egypt eastwards to Scindh.

O. baccatus, Del. Fl. Ægypt. 92, t. 31; Boiss. Flor. Orient. i. 422; Oliv. Flor. Trop. Afr. i. 104; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 182.

Nom Vern. Girdhi. (Schweinf.)

Socotra. Common on the limestone plains at the east and west ends of the island. B.C.S. n. 2. Schweinf. n. 372.

Distrib. Nile Land and through Arabia to Scindh.

Order VI. VIOLARIEÆ.

A small family of about twenty-one genera of herbs or under-shrubs represented in all parts of the world. The herbaceous forms are chiefly temperate, the shrubby more frequently tropical.

1. VIOLA.

Viola, Linn. Gen. n. 1007; Benth. et Hook. Gen. Pl. i. 117.

A large genus of about one hundred species of herbs, distributed in temperate and mountainous regions all over the world.

V. cinerea, Boiss. Diagn. sér. 1. 1. 7. Flor. Orient. i. 454; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 185.

Socotrâ. Near Galonsir. B.C.S. n. 701.

Distrib. Through Arabia and Persia to Afghanistan.

Our specimens are not in flower, but I have no doubt of the identification.

2. IONIDIUM.

Ionidium, Vent. Hort. Malm. t. 27; Benth. et Hook. Gen. Pl. i. 117.

A considerable genus of herbaceous or shrubby plants represented chiefly in America.

1. **suffruticosum,** Ging. ex DC. Prod. i. 311 ; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 185.

I. enneaspermum, Vent. Hort. Malm. 27 ; DC. Prod. i. 308 ; Oliv. Flor. Trop. Afr. i. 105.

Socotra. Common. B.C.S. n. 214. Schweinf. in lit.

DISTRIB. Widely spread in the tropics of the old world and in Australia. The only species found in tropical Africa.

3. ALSODEIA.

Alsodeia, Thouars Hist. Veg. Afr. 55, tt. 17, 18 ; Benth. et Hook. Gen. Pl. i. 118.

A considerable genus of tropical and subtropical regions, chiefly American, but with several representatives in Africa, Asia, and the Indian Ocean islands, but the Indian forms are quite distinct from the African. The Socotran species is endemic.

A. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Herbacea ramosissima humilis glabra ; foliis parvis ellipticis v. subobovatis brevissime petiolatis obscure remoteque serrulatis subtus glanduloso-puberulis ; floribus solitariis ; filamentis brevissimis.

Pedalis glabra dense ramosissima herbacea ramis erectis striatis angulatis. *Folia* breviter petiolata $\frac{1}{2}$–$\frac{2}{3}$ poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata elliptica v. oblongo-elliptica v. subobovata apice acuta nonnunquam obtusa basi attenuata cuneiformia margine inferne integra superne remote serrata revoluta supra puberulo-scabridula subtus glanduloso-puberula pallidiora plerumque basi 3–5-nervia. *Stipulæ* parvæ $\frac{1}{16}$ poll. longæ membranaceæ ovatæ extus pubescentes apice glandula capitata terminatæ concavæ dorsaliter medio nervo prominente. *Flores* minuti solitarii ; pedicelli supra medium articulati $\frac{1}{12}$ poll. longi demum $\frac{3}{10}$ poll. longi ; bracteolæ ovato-acutæ minutæ pilosæ. *Sepala* $\frac{1}{12}$ poll. longa lanceolata acuta obscure pubescens. *Petala* sepalis dimidio breviora acuta v. obtusa. *Staminum* filamenta brevissima ; connectivum ultra loculos latum. *Discus* inconspicuus 5-lobus. *Ovarium* glabrum. Fruct. ignot.

Socotra. Near Tamarida. B.C.S. n. 26.

DISTRIB. Endemic.

A very distinct herbaceous species, widely separate from all other described old world forms by its habit and foliage. It has to some extent the facies of *A.* (Scyphellandra) *virgata,* Thwaites (Enum. Pl. Zeyl. 21 ; Hook. fil. and Thoms. in Hook. Flor. Brit. Ind. i. 189), but that is a more woody plant, and is moreover distinguished by its stamens squamate on the back.

It is not abundant on the island ; we only found it at one locality.

Order VII. BIXINEÆ.

A family of trees or shrubs included in thirty genera, chiefly found in the tropics.

ABERIA.

Aberia, Hochst. in Flora 1844, Beil. 2; Benth. et Hook. Gen. Pl. i. 128.

A genus of seven species of trees or shrubs. Two of these occur at the Cape, one is peculiar to Ceylon, and the remaining four are tropical African. The Socotran plant is one of these last.

A. abyssinica, Clos in Ann. Sc. Nat. sér. 4. viii. (1857), 236; Oliv. Flor. Trop. Afr. i. 122.

Roumea abyssinica, Ach. Rich. Tent. Flor. Abyss. i. 34, t. 8.

NOM. VERN. Ugelhas (B.C.S.)

Socotra. Common. B.C.S. n. 384. Schweinf. n. 609.

DISTRIB. Abyssinia.

We obtained specimens of this plant with very young flower buds only, but Schweinfurth, in the month of May, got male flowers in splendid condition, which enable us to determine it. Although the female flowers and fruit of our Socotran plant are unknown, the general resemblance with the Abyssinian plant is so great as to leave little doubt as to their identity. Richard describes the Abyssinian plant as a large tree; on Socotra it is little more than a shrub.

Order VIII. POLYGALEÆ.

A considerable order of herbs, rarely trees, widely dispersed all over the world.

POLYGALA.

Polygala, Linn. Gen. n. 851; Benth. et Hook. Gen. Pl. i. 136.

A very large genus of herbs or shrubs found in temperate and tropical regions of both hemispheres. Of the Socotran species, two are essentially north-west tropical African and south-west Asiatic species, one, however, extending to the Cape de Verde Islands and the other to Natal; the third species is not African, but is found out of tropical Asia in Socotra and in Australia.

1. P. abyssinica, Fres. in Mus. Senck. ii. 273; Oliv. Flor. Trop. Afr. i. 130; Benn. in Hook. Flor. Brit. Ind. i. 202.

Socotra. Common. B.C.S. n. 602.

DISTRIB. Abyssinia to Natal, and in Afghanistan and north-west India.

2. P. erioptera, DC. Prod. i. 326; Boiss. Flor. Orient. i. 469; Benn. in Hook. Flor. Brit. Ind. i. 203.

P. triflora, T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 6.
P. triflora, Oliv. Flor. Trop. Afr. i. 128.

Socotra. On the plains. B.C.S. n. 692. Schweinf. n. 735.

Distrib. From Cape de Verde Islands through tropical Africa and Arabia to northern India.

3. P. chinensis, Linn. Sp. 989; Benn. in Hook. Flor. Brit. Ind. i. 204.
P. arvensis, Willd. Sp. iii. 876; DC. Prod. i. 326.

Socotra. Found sparingly on the limestone plains. B.C.S. n. 693.

Distrib. Tropical Asia and Australia. Absent from Africa.

Order IX. CARYOPHYLLEÆ.

A large family of herbs, essentially plants of the extratropical and alpine regions of the northern hemisphere. More rare between the tropics.

1 GYPSOPHILA.

Gypsophila, Linn. Gen. n. 563; Benth. et Hook. Gen. Pl. i. 146.

A genus of about fifty species of herbs, natives of the Mediterranean region, especially the northern shores, and of south-west Asia. One species (possibly introduced) extends to Australia and New Zealand.

G. montana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 501.
G. somalensis, Franch. Sert. Somal. in Miss. Révoil 14.

Perennis glabra v. plus minusve glanduloso-pilosa; foliis crassiusculis obovato-spathulatis; cymis laxis ramosis; pedicellis calyce et bracteis foliaceis longioribus; calyce campanulato ad medium 5-fido; petalorum limbo distincto truncato; capsula calyci æquilonga; seminibus punctulato-tuberculatis.

Herba caule perenni lignoso procumbente ramoso ramis adscendentibus usque ad 2-ped. glabris sed sæpe glanduloso-pilosis. *Folia* 1½ poll. longa ⅓–½ poll. lata obovato-spathulata v. oblonga et in petiolum brevem gradatim attenuata obtusa et sæpe mucronulata v. acuta crassiuscula glabra v. subglanduloso-pilosa. *Cymæ* dichotome ramosissimæ effusæ divaricatæ; pedicelli glanduloso-pilosi ultimi capillares erecti ½ poll. longi; bracteæ foliaceæ pedicellis multo-breviores. *Calyx* subglaber v. sparsim glanduloso-pilosus ¼ poll. longus campanulatus 5-lobatus lobis longe acutis tubum æquantibus margine submembranaceis, tubi intervallis membranaceis angustis. *Petala* trinervia glabra alba v. lilacina ¼ poll. longa, ungue in limbum truncatum erosum v. emarginatum sensim dilatato basi acuto. *Ovarium* 8-ovulatum. *Capsula* apice subbifida breviter stipitata calyci æquilonga oligosperma. *Semina* nigra tuberculata; embryonis radicula elongata.

Socotra. On the Haghier hills, at an elevation of over 2500 feet. B.C.S. n. 442.

Distrib. Aden.

This species, as yet known only from Aden, Somali Land, and from Socotra, finds perhaps its nearest allies in *G. polyclada*, Fenzl. (in herb. Kotschy Pers. Austr. n. 674; Boiss. Flor. Orient. i. 542), a Persian plant, and as Franchet suggests in *G. Arrostii*, Guss. (Pl. Rar. 160, t. 30), a south European species; but it is easily separated by foliage, inflorescence, and flowers. With *G. bellidifolia*, Boiss. (Diagn. sér. 1, i. 11, non Willd.), a species from Muscat and Beloochistan, there is also much resemblance; but that plant is an almost unbranched annual, with a very small inflorescence and with many seeds.

This beautiful plant of the Socotran hills I found in great abundance in the shaded moist ravines near the summit of the Sicante peaks of the Haghier range. The same plant was subsequently brought from Somali Land by Révoil, and Franchet, unaware of the publication of my diagnosis, described it (*loc. cit.*) as a new species, *G. somalensis*. It is a somewhat variable plant, at times being almost glabrous, whilst from other situations it has a densely viscid glandular hairy covering. With the presence of this greater viscidity is associated a more robust habit, very marked in the inflorescence, which becomes more densely branched, the branches diverge more, and the terminal ones are much shortened. The flowers, too, are slightly larger. To this viscid hairy form, which is the only one sent by Schweinfurth, and is the form from Somali Land, I have given a distinct varietal name—

G. **montana**, var. **viscida**, Balf. fil., in Proc. Roy. Soc. Edin. xiii. (1883).

Robustior inflorescentiæ ramis ultimis brevioribus et omnino pilis glandulosis vestita.

Socotra. Rarer than the type. B.C.S. n. 554. Schweinf. n. 658.

Distrib. Somali Land.

The Socotran plant appears to be identical with a hitherto undescribed one, first found at Aden by Thomson in 1872, and since sent home from that locality by several collectors. We obtained it there in abundance. In the Aden plant variations in habit and clothing of the same character as in the Socotran specimens are observed, though not so strongly marked. But there is a farther variation observable in the inflorescences and flowers of the glabrous form as found at Aden. The former become exceedingly diffuse, and the pedicels are very short and delicate; the latter are greatly reduced in size, often less than half those of the Socotran plants. In fact the inflorescence assumes more the appearance of an *Arenaria*. I can find, however, no sufficient character separating the forms as species, though a varietal name may be assigned to the Aden plant, and it may be described as—

G. **montana**, var. **diffusa**, Balf. fil.

Herba inflorescentia diffusa ramosa ramulis ultimis capillaribus floribusque minoribus.

Aden. Found by many collectors.

Distrib. Endemic.

2. SILENE.

Silene, Linn. Gen. n. 567; Benth. et Hook. Gen. Pl. i. 147.

A very large genus of herbs, abundant in Europe, the Mediterranean region, and temperate Asia. A few are also found at the Cape and in North America.

S. apetala, Willd. Sp. ii. 703; DC. Prod. i. 369; Boiss. Flor. Orient. i. 596.

Socotra. Common on the hills at all elevations. B.C.S. n. 352. Schweinf. n. 664.

Distrib. Canary Islands and circum-Mediterranean region, Persia and Afghanistan.

3. ARENARIA.

Arenaria, Linn. Gen. n. 569; Benth. et Hook. Gen. Pl. i. 149.

A large genus, chiefly of temperate and alpine regions.

A. serpyllifolia, Linn. Sp. 606; DC. Prod. i. 411; Boiss. Flor. Orient. i. 701; Oliv. Flor. Trop. Afr. i. 142; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 239; Eng. Bot. Syme t. 236.

Socotra. Abundant in many places. B.C.S. n. 702.

Distrib. A common weed.

4. POLYCARPÆA.

Polycarpæa, Lamk. in Journ. Hist. Nat. ii. 8, t. 25, ex DC.; Benth. et Hook. Gen. Pl. i. 154.

A genus of twenty-six species of small herbs, many of them badly defined, spread through the tropical and warmer regions of the old world, one extending into tropical America. Two of the Socotran species are endemic. Another is a wide spread species of both old and new worlds, whilst a fourth is a south-west Asiatic and north-west African form extending to Australia, which, in Socotra, exhibits a distinct varietal character.

1. P. corymbosa, Lamk. Ill. ii. 129; DC. Prod. iii. 374; Oliv. Flor. Trop. Afr. i. 145; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 245; Wight Ic. t. 712.

Socotra. On the plain near Kadhab. B.C.S. n. 20.

Distrib. A very widely spread tropical plant of both old and new worlds. A very small form of this species occurs on Socotra.

2. P. spicata, Arn. in Ann. Nat. Hist. iv. (1839), 91 ; Boiss. Flor. Orient. i. 738; Oliv. Flor. Trop. Afr. i. 146; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 246; Wight Ic. t. 510.

P. staticæformis, Hochst. et Steud. in herb. Schimp. Arab. sect. 1 n. 940.

Nom Vern. 'Teyeycha.

Socotra. Not uncommon. Our plants are from the Haghier hills near Tamarida. B.C.S. n. 371.

Distrib. Abyssinia, Egypt, and through Arabia to the Indian Peninsula. Also Australia.

This species, which has a wide distribution in the regions around Socotra, is a very marked one in the genus by reason of its Statice-like habit, a character which is shared with it by all the members of the genus in Socotra. Specific limits are at present notably difficult to define in this genus, and the Socotran plants referred to this species depart considerably from the ordinary type as it occurs on the mainland. Normally this is more or less spathulate, fleshy, glaucous, with a few rigid erect branches rising from a basal rosette and subsequently dividing by pairs but not copiously. Now the Socotran plant is more delicate, more copiously branched, with less fleshy leaves, which are usually setose at the point, and whilst the radical leaves are spathulate, they narrow to the base much more gradually, and the leaves on the branchlets are greatly narrowed, becoming at times quite filiform and very long. I should have had more hesitation in referring our plant to this species, but for a specimen of Gay's, in Kew Herbarium, labelled *P. staticæformis,* var. *ramosissima,* which is certainly *P. spicata,* but is very greatly branched, and the upper leaves are much narrowed after the fashion of those in our plant, and it is a link uniting our plant with the type.

But there is also a plant found by both Schweinfurth and our party in Socotra, not abundantly, which I think it is advisable to refer to this species, but as a distinct variety. In general habit it resembles the Socotran forms above referred to, but is very sparingly branched, in this respect coming near the mainland type. But its leaves are very small and thread-like. The basal ones have almost entirely disappeared from our specimens, and as the branches carry but few, the plant has a very bare look. The primary floral axes too are exceedingly attenuated, though straight and ascending. One of the most striking features is the uniform coloration of the bracteoles. These have not a scarious margin with a midrib tinged with colour, as in the type, but with almost no scarious margin, are throughout of a fawn or brown tint, and this contrasts in the dry state very markedly with the white scarious sepals of the flowers, which in the fresh condition are deep purple along the midribs. These differences are evident enough, but as I have failed to obtain any distinctive characters in the flowers, and moreover, as coincident with the narrowing of the

leaves in Gay's specimen above referred to, I find in many of the flowers a reduction in extent of the scarious margin of the bracteoles and increase in the area of coloration, I have for the present considered the Socotran form as conspecific with *P. spicata*. But I have given it a varietal designation. This, as well as the identification of the last species, must be regarded as provisional. Farther exploration of the regions around Socotra will, as Oliver remarks in a note to the tropical African species, discover other forms, rendering more precise diagnoses of the species possible. This Socotran plant, then, is diagnosed thus :—

P. spicata, Arn., var. **capillaris**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Tenuior pauciramosus; foliis paucis filiformibus; bracteolis siccis rufis marginibus vix scariosis.

Socotra. Near Galonsir and elsewhere. B.C.S. n. 211. Schweinf. n. 239.

Distrib. Endemic.

3. P. divaricata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 502.

Annua glabra ramosissima erecta; foliis submembranaceis apice setosis, radicalibus rosulatis spathulatis, ramalibus longe oblanceolatis v. filiformibus; stipulis acuminatis; floribus sessilibus in spicas imbricatas ad extremitates rhachium longorum positas aggregatis; sepalis ovato-lanceolatis petalis capsulisque longioribus.

Herba tenuis viridis omnino glabra annua ramosissima ramis divaricatis rectis et subgeniculatis. *Folia* non distincte petiolata submembranacea et sæpissime setoso-apiculata, radicalia rosulata spathulata obtusa v. acuta $\frac{3}{4}$–1 poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata, ramulorum angusta longe oblanceolata acutissima v. filiformia plurima ad nodum quemque fasciculata 1 poll. longa. *Stipulæ* minutæ scariosæ ovato-acuminatæ. *Flores* sessiles in spicas 10–16-floras ad apices rhachium 1–1$\frac{1}{3}$ poll. longorum rectorum capillarium secundim congesti; bracteolæ subcarinatæ nervo medio colorato lateribusque scariosis. *Sepala* ovato-lanceolata scariosa subcarinata, medio nervo colorato, $\frac{1}{6}$ poll. longa petalis duplolongiora. *Petala* lanceolata apice angustata dentata purpurea. *Antheræ* parvæ filamentis multo breviores. *Stylus* ovario brevior. *Capsula* sepalis dimidio breviora sed petalis paullo longiora.

Socotra. Not so common as the foregoing. Found in several localities, often at considerable elevation. B.C.S. n. 684. Schweinf. n. 543.

Distrib. Endemic.

A very beautiful Statice-like annual. Its general facies is not unlike the forms of *P. spicata*, Arn., on Socotra; but its less robust habit, its foliage, and the relative dimensions of the parts of the flower, distinguish it.

4. P. cæspitosa, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 502.

Perennis subcæspitosa glabra; caulibus prostratis v. subterraneis; foliis subcrassis anguste spathulatis v. oblanceolatis; stipulis fimbriatis; floribus sessilibus in spicas paucifloras ad apices rhachium longorum congestis; sepalis ovato-acutis infra late scarioso-alatis; petalis sepalis subæquilongis et capsulis longioribus.

Perennis pedalis. *Caules* lignosi si epigœi glauci cum baseis foliorum persistentibus incrassatis vestiti; ramuli annui recti v. nonnunquam anfractuosi tenues striati ex axillis foliorum dense rosulatorum adscendentes. *Folia* basalia 1–1$\frac{1}{4}$ poll. longa $\frac{1}{12}$ poll. lata

anguste spathulata v. oblanceolata acuta rarius subapiculata v. obtusa, ramulorum sæpe filiformia plurimæ ad nodum quemque fasciculata. *Stipulæ* minutæ margine scariosæ fimbriatæ. *Flores* sessiles in spicas densas breves pauciflores apice rhachium longorum rectorum congestas dispositi; bracteolæ fusco-rufæ late ovatæ medio nervo prominente, margine subscariosæ basi fimbriatæ. *Sepala* $\frac{1}{8}$–$\frac{1}{5}$ poll. longa ovato-acuta medio nervo herbaceo, margine basi late scarioso-alata, rufa. *Petala* sepalis subaquilonga apice anguste dentata. *Staminum* filamenta basi ampliata; antheræ magnæ filamentis dimidio breviores. *Stylus* ovario longior. *Capsula* petalis breviora.

Socotra. On the plains beyond Tamarida and elsewhere; not uncommon. B.C.S. n. 683.

A very distinct perennial, with a luzuloid habit. It varies somewhat with its locality. In some specimens from dry and stony spots the stems are gnarled, hard, brittle, prostrate, and very glaucous, clothed with but few leaves, and having annual shoots only two or three inches long. On the other hand, when from more penetrable ground, the stems are thin, flexible, and straggling, bearing delicate, straight, almost capillary branchlets a foot or more high.

Order X. PORTULACEÆ.

A small family of shrubs or under-shrubs frequently succulent, chiefly characteristic of America, with a few confined to South Africa and Australia, and some spread in the old world.

1. PORTULACA.

Portulaca, Linn. Gen. n. 603; Benth. et Hook. Gen. Pl. i. 156.

A small genus of herbs, most of which are American, but a few are weeds of wide range in tropical countries, and extend into temperate regions.

1. P. oleracea, Linn. Sp. 638; Boiss. Flor. Orient. i. 757; Oliv. Flor. Trop. Afr. i. 148; Dyer in Hook. Flor. Brit. Ind. i. 246.

Socotra. Abundant. B.C.S. n. 12.

Distrib. A common tropical weed.

2. P. quadrifida, Linn. Mant. 73; Boiss. Flor. Orient. i. 757; Oliv. Flor. Trop. Afr. i. 149; Dyer in Hook. Flor. Brit. Ind. i. 247; Wight Illustr. t. 109.

Socotra. Abundant. B.C.S. n. 601. Schweinf. n. 724; Hunt. n. 6.

Distrib. A common old world tropical weed.

2. TALINUM.

Talinum, Adans. ex Juss. Gen. 312; Benth. et Hook. Gen. Pl. i. 157.

A small genus of herbs of warm and tropical regions; all American except a few, which are Asiatic or African.

T. cuneifolium, Willd. Sp. ii. 864; DC. Prod. iii. 357; Oliv. Flor. Trop. Afr. i. 150; Dyer in Hook. Flor. Brit. Ind. i. 247.

Socotra. Near Tamarida and Galonsir. B.C.S. n. 712. Schweinf. n. 522.

Distrib. Through tropical Africa, Arabia, and in India.

Order XI. TAMARISCINEÆ.

A small family of shrubby or arboreous, rarely herbaceous, species of sandy regions in the warmer and temperate regions of the northern hemisphere; a few also south African.

TAMARIX.

Tamarix, Linn. Gen. n. 375; Benth. et Hook. Gen. Pl. i. 160.

A genus of badly defined species of shrubs or small trees, inhabitants of saline sandy districts in the Mediterranean region, and in temperate and sub-tropical Asia, also at the Cape.

T. gallica, Linn. Sp. 386; DC. Prod. iii. 96; Oliv. Flor. Trop. Afr. i. 151; Dyer in Hook. Flor. Brit. Ind. i. 248.

Nom. Vern. Kalko. (B.C.S.)

Socotra. Shore at Gharriah and elsewhere. B.C.S. n. 489. Schweinf. n. 627.

Distrib. A widely dispersed plant on the west and south shores of Europe, north and tropical Africa, and south Asia.

The form of this variable species found in Socotra is that which occurs on the adjacent Arabian coast, and described by Bunge (Tent. Gen. Tamar. Dorpat 1852, ex Boiss. Flor. Orient. i. 774) as *T. Mascatensis.*

Order XII. HYPERICINEÆ.

A considerable family of herbaceous, shrubby, or arboreous plants, widely dispersed in temperate and warmer regions of the world.

HYPERICUM.

Hypericum, Linn. Gen. n. 902; Benth. et Hook. Gen. Pl. i. 165.

A large genus of herbaceous or shrubby species ranging over the whole world; most abundant in the temperate northern hemisphere and on the mountain ranges within the tropics. There are four Socotran species, of which two are endemic, one is entirely African and Mascarene, and the other is an Indian and Ceylon form.

1. **H.** (Androsæmum) **mysorense,** Heyne in Wall. Cat. 4808; Dyer in Hook. Flor. Brit. Ind. i. 253.

Norisca mysorensis, Arn; Wight Ic. t. 56.

Socotra. Rocky places at an elevation of over 1500 feet. B.C.S. nn. 557, 606. Schweinf. nn. 569, 755. Nimmo.

Distrib. Indian Peninsula, Ceylon.

A species with long sub-pendulous or trailing branches and large showy yellow flowers. As it grows on Socotra it is found only at considerable elevations. Schweinfurth has it from Kischen.

Like the nearly allied African species *H. lanceolatum,* Lamk., presently to be referred to, it assumes several forms, varying both as regards foliage, leaves, calyx, and styles. On Socotra there are two distinct states. One with narrow lanceolate or oblong-lanceolate leaves, $1\frac{1}{2}$–$1\frac{3}{4}$ inches long and $\frac{1}{4}$ to $\frac{5}{12}$ inch broad, in which the styles are free almost to their base. The other has longish ovate or ovate-acuminate leaves, $1\frac{1}{4}$ inches long by 7–8 lines broad, and the styles are united almost to the apex, showing only a slight cleaving into five segments. Between these extremes there are many intermediate states. The calyx-segments vary in the species from oblong to ovate, and are from $\frac{1}{4}$ inch to over $\frac{1}{2}$ inch in length.

Indian and Ceylon specimens show, as a rule, a large calyx and free styles. The 3–5 pellucid veins are extremely characteristic of the foliage of this species, and they are well marked in the Socotran plants, as well as in Heyne's type specimen; but in the other Indian specimens in Kew Herbarium they are somewhat obscure. By this character of the venation the plant may be readily separated from *H. lanceolatum,* as well as by its larger flowers and leaves.

Dyer (*loc. cit.*) gives the distribution of the species as limited to the Indian Peninsula and Ceylon. I find, however, a plant in Kew Herbarium labelled by Sir William Hooker "Shores of the Red Sea." This belongs to a set of specimens which, through the assistance of Sir Joseph Hooker by consulting Sir William Hooker's correspondence, I find were sent home by Dr Nimmo from Bombay. Many of the specimens in this collection were, he states, obtained from Socotra during the period of its occupation by Indian troops (1834–1839), and there can be little doubt that this Hypericum came from Socotra. In Kew Herbarium I have found several specimens belonging to this collection of Nimmo's and with the label "Shores of the Red Sea," and some of them have been described and recorded as from that locality. In many cases the plants are identical with Socotran forms known from no other locality, and in such instances I have, therefore, had no hesitation in considering that Nimmo's plants were really brought from Socotra. I shall, under the several species, take notice of this fact.

This Hypericum has then an interesting distribution, being restricted to the Indian Peninsula, Ceylon, and Socotra.

H. gnidiæfolium, Ach. Rich. (Tent. Flor. Abyss. i. 98), quoted by Dyer as an ally, is a very different plant.

2. H. (Androsæmum) **lanceolatum**, Lamk. Encyc. iv. 145; DC. Prod. i. 545; Oliv. Flor. Trop. Afr. i. 156.

Nom. Vern. Seghor.

Socotra. On the higher rocky parts of the hills. B.C.S. n. 246.

Distrib. African and Mascarene. From Abyssinia to the Transvaal, also Bourbon and Madagascar. Widely dispersed in mountainous regions.

A very beautiful species, not far removed from the last, and like it presenting a considerable amount of variation, both in size of leaf and degree of union of the styles. The Socotran plant resembles that from the Cameroon mountains in having very deeply divided styles, whilst in most of the continental forms the styles are only free through about $\frac{1}{3}$ of their length. The flowers of the Socotran plant are somewhat smaller than those of the continental ones, but in Socotra the species does not exhibit so much departure from the normal mainland type as it does in Bourbon, where the leaves grow very large, reaching $1\frac{1}{2}$ to 2 inches in length, and the sepals take an acute form.

3. H. (Arthrophylla) **scopulorum**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 502. Tab. IV. A.

Glabrum glaucum ramulis quadrangulis; foliis oblongo-ovatis obtusis sessilibus decussatis glanduloso-punctatis; pedunculis unifloris axillaribus; sepalis basi subconnatis ensiformibus eglandulosis; staminibus stylis brevioribus.

Suffrutex glaber bipartim ramosus sæpe tortuosus lignosusque, ramulis juvenilibus quadrangulatis glaucis rufescente-purpureis, cortice rumpente. *Folia* decussata sessilia subamplexicaulia $\frac{2}{3}$–$1\frac{1}{4}$ poll. longa $\frac{1}{4}$–$\frac{1}{2}$ poll. lata oblongo-elliptica v. subobovata obtusa v. rarius subacuta, margine revoluta, sempervirentia glauca coriacea glanduloso-punctata. *Flores* solitarii in pedunculos tenues adscendentes axillares minute 2-bracteatos $\frac{1}{3}$ poll. longos obsiti. *Sepala* æqualia basi subconnata, laciniis ensiformibus acutissimis striatis non imbricatis eglandulosis $\frac{1}{5}$ poll. longis petalis brevioribus. *Petala* persistentia oblique obovato-oblonga obtusa $\frac{1}{4}$ poll. longa. *Stamina* triadelphia $\frac{1}{6}$ poll. longa. *Ovarium* tricarpellare $\frac{1}{12}$ poll. longum. *Styli* 3 divaricati curvati apice attenuati, $\frac{1}{8}$ poll. longi stamina excedentes. *Capsula* trilocularia septicide trivalva longitudinaliter vittata. *Semina* cylindrica lente curva lineato-punctata; raphe prominula.

Socotra. Not uncommon amongst the boulders on the Socotran hills at altitudes over 1000 feet. B.C.S. n. 405. Schweinf. nn. 622, 756.

Distrib. Endemic.

This small shrubby plant is a very distinct species. It finds its nearest

affinity in two plants from the Levant—*H. nanum*, Poir. (Suppl. Dict. iii. 699; Boiss. Flor. Orient. i. 792) and *H. cardiophyllum*, Boiss. (*loc. cit.* 791)—but without any risk of being mistaken for them. As in most species of the genus having a shrubby habit, the young leafy shoots are elongated and erect, but the older parts form a woody, twisting, branched plant.

4. H. (Arthrophylla) **tortuosum**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 502. Tab. IV. B.

Glabrum glaucum ramulis quadrangulis; foliis obovatis v. elliptico-oblongis v. subrotundis obtusis v. subacutis, inferioribus petiolatis, superioribus sessilibus decussatis, pellucido-punctatis; floribus in cymas terminales dispositis; sepalis elongato-ellipticis imbricatis eglandulosis; staminibus stylis brevioribus; capsulis verrucosis.

Suffrutex lignosus glaber glaucus ramosissimus ramis tortuosis, juvenilibus quadrangulis rufescente-purpureis. *Folia* decussata $\frac{2}{3}$–1 poll. longa $\frac{1}{4}$–$\frac{5}{12}$ poll. lata obovata v. elliptico-oblonga obtusa v. subacuta basi sæpe subcuneata margine revoluta, inferiora omnia petiolata petiolo $\frac{1}{5}$–$\frac{1}{3}$ poll. longo, superiora sub inflorescentia omnino sessilia plerumque subrotundata late amplexicaulia decurrentia, sempervirentia glauca subcoriacea pellucido-punctata. *Cymæ* terminales multo-ramosæ subumbellatæ; pedicelli tenues $\frac{2}{3}$ poll. longi; bracteolæ minutæ. *Sepala* $\frac{1}{8}$ poll. longa petalis breviora inæqualia breviter connata elliptica v. oblongo-elliptica acuta venulosa, margine membranacea imbricata eglandulosa. *Petala* $\frac{1}{4}$ poll. longa persistentia irregularia oblonga v. ovato-oblonga sæpe subunguiculata obliqua, apice truncata v. obtusa v. breviter bifida *Stamina* triadelphia $\frac{1}{5}$ poll. longa. *Ovarium* tricarpellare $\frac{1}{12}$ poll. longum. *Styli* 3 divaricati incurvati gradatim versus apicem attenuati $\frac{1}{5}$ poll. longi. *Capsula* trilocularia septicide trivalva longitudinaliter verrucosa. *Semina* curvata lineato-punctata; raphe prominula.

Socotra. With the foregoing species on the Haghier range at a high elevation. B.C.S. n. 607. Schweinf. n. 757.

Distrib. Endemic.

A distinct species, in every way allied to the foregoing, but altogether a smaller plant.

Order XIII. MALVACEÆ.

A large family, representatives of which are found in all parts of the world, except in Arctic regions. In Socotra there are six genera. Four of these are generally dispersed in the tropics, one is essentially a genus of temperate regions of the old world, and the other has a limited distribution in north-west Africa and south-west Asia.

1. MALVA.

Malva, Linn. Gen. n. 841; Benth. et Hook. Gen. Pl. i. 201.

A small genus of herbs, natives of the temperate regions of the old world, but several species are now spread as weeds over the world.

M. parviflora, Linn. Sp. 969; DC. Prod. i. 433; Boiss. Flor. Orient. i. 820; Mast. in Oliv. Flor. Trop. Afr. i. 177, and in Hook. Flor. Brit. Ind. i. 321.

Socotra. On the limestone plains near villages. B.C.S. n. 55.

Distrib. Through the Levant, Arabia and Persia to north-west India. Also Nubia.

2. SIDA.

Sida, Linn. Gen. n. 837; Benth. et Hook. Gen. Pl. i. 203.

A considerable genus of herbs or shrubs, having its chief distribution in America, but including several common tropical weeds. To this latter category belong three of the Socotran species; the fourth being confined to north-west Africa and south-west Asia.

1. S. cordifolia, Linn. Sp. 961; DC. Prod. i. 464; Mast. in Oliv. Flor. Trop. Afr. i. 181, and in Hook. Flor. Brit. Ind. i. 324.

Socotra. In the valley Kischen. Schweinf. n. 761.

Distrib. A common tropical weed.

This plant our party did not obtain.

2. S. rhombifolia, Linn. Sp. 961; DC. Prod. i. 462; Boiss. Flor. Orient. i. 835; Mast. in Oliv. Flor. Trop. Afr. i. 181, and in Hook. Flor. Brit. Ind. i. 323; Franch. Sert. Somal. in Miss. Révoil 16.

Nom. Vern. Suffaih. (Schweinf.)

Socotra. Common. B.C.S. nn. 231, 392. Schweinf. n. 364.

Distrib. Widely dispersed in the tropics.

3. S. humilis, Willd. Sp. iii. 744; DC. Prod. i. 463; Mast. in Oliv. Flor. Trop. Afr. i. 179, and in Hook. Flor. Brit. Ind. i. 322; Cav. Diss. v. 277, t. 134, f. 2.

Socotra. By the Wadi Digal. Schweinf. n. 491.

Distrib. General in the tropics.

Another plant not found by our party.

4. S. grewioides, Guill. et Perr. Fl. Seneg. i. 71; Boiss. Flor. Orient. i. 835; Mast. in Oliv. Flor. Trop. Afr. i. 182, and in Hook. Flor. Brit. Ind. i. 323.

Socotra. Common on the limestone plains. B.C.S. n. 45.

Distrib. Tropical Africa, Arabia, Scindh, and north-west India.

3. ABUTILON.

Abutilon, Gærtn. Fruct. ii. 251, t. 135, f. 1; Benth. et Hook. Gen. Pl. i. 204.

A considerable genus of herbs, shrubs, or trees, widely dispersed in the warmer regions of the globe.

1. A. fruticosum, Guill. et Perr. Fl. Seneg. i. 70; Boiss. Flor. Orient. i. 836; Mast. in Oliv. Flor. Trop. Afr. i. 187, and in Hook. Flor. Brit. Ind. i. 328. Franch. Sert. Somal. in Miss. Révoil 15.

A. microphyllum, Ach. Rich. Tent. Flor. Abyss. i. 70, t. xv.
A. denticulatum, Planch. in herb. Hook.; T. And. in Journ. Linn. Soc. v. (1860), Suppl. 8.
Sida denticulata, Fres. Mus. Senck. i. 182.

NOM. VERN. Gehuha (B.C.S.)

Socotra. Common. B.C.S. nn. 374, 703. Schweinf. nn. 380, 546.

DISTRIB. From the Canary Islands through tropical Africa, Syria, Arabia, and Scindh, and reaching to Java.

The species presents on Socotra considerable variation in its foliage. This character is however exhibited by the plant in other localities. We have a form (n. 374) from the island, in which the stems and leaf-petioles, as well as the mid-ribs, are covered with long delicate spreading hairs, so that they are quite pilose. This covering is additional to the normal close-set tomentum.

2. A. muticum, G. Don. Syst. Veg. i. 502; Boiss. Flor. Orient. i. 836; Mast. in Hook. Flor. Brit. Ind. i. 327.

A. glaucum, G. Don. Syst. Veg. i. 504; Mast. in Oliv. Flor. Trop. Afr. i. 185.
Sida glauca, Cav. Ic. i. 8, t. 11.

Socotra. Sparingly on the plains. B.C.S. n. 704.

DISTRIB. From Cape de Verde Islands through tropical Africa, and in tropical Asia generally.

4. SENRA.

Senra, Cav. Diss. ii. 83, t. 35, f. 3, and 104 adnot; Benth. et Hook. Gen. Pl. i. 207.

A monotypic genus, confined to Nile Land, Arabia, and Scindh.

S. incana, Cav. Diss. ii. 83, t. 35, f. 3; Boiss. Flor. Orient. i. 838; Mast. in Oliv. Flor. Trop. Afr. i. 194, and in Hook. Flor. Brit. Ind. i. 334; Franch. Sert. Somal. in Miss. Révoil 15.

Serræa incana, Dene. in Ann. Sc. Nat. Sér. 2. iv. 70, t. 4; Wight Ic. t. 1592.
Dumreichera arabica, Hochst. et Steud. in herb. Schimp. Abyss. sect. i. n. 817.

NOM. VERN. Fereedah (B.C.S.)

Socotra. Very common around Galonsir and other villages. B.C.S. n. 4. Schweinf. n. 324.

DISTRIB. Of the genus.

5. HIBISCUS.

Hibiscus, Linn. Gen. n. 846; Benth. et Hook. Gen. Pl. i. 207.

A vast genus of herbs, shrubs, or trees, widely dispersed in the tropics. On Socotra nine species are found; three, and probably a fourth, are endemic, the

rest are old world forms, one being tropical African alone and the others have a distribution in tropical Africa and south-west Asia, one of them being also abundant in the islands of the Indian Ocean, and one reaching Australia.

1. H. (Bombicella) **intermedius**, Ach. Rich. Tent. Flor. Abyss. i. 58; Mast. in Oliv. Flor. Trop. Afr. i. 198, and in Hook. Flor. Brit. Ind. i. 336.

Socotra. On the plains about Galonsir and Tamarida. B.C.S. n. 219. Schweinf. n. 321.

Distrib. East-and north-east tropical Africa, Arabia, and Scindh.

2. H. (Bombicella) **micranthus**, Linn. fil. Suppl. 308; DC. Prod. i. 453; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 8; Mast. in Oliv. Flor. Trop. Afr. i. 205 and in Hook. Flor. Brit. Ind. i. 335.

H. clandestinus, Cav. Ic. i. 1, t. 2.
H. ovalifolius, Vahl Symb. i. 50; Boiss. Flor. Orient. i. 839.

Socotra. Not uncommon. B.C.S. 148. Schweinf. n. 331.

Distrib. Tropical Africa, Arabia, and India.

A species which varies in Socotra, as it does in other localities of its wide distribution. Schweinfurth sends specimens which show "petala alba reflexa."

3. H. (Lagunæa) **Solandra**, L'Hér. Stirp. i. 103, t. 49; Mast. in Oliv. Flor. Trop. Afr. i. 206, and in Hook. Flor. Brit. Ind. i. 336.

Lagunæa lobata, Willd. Sp. iii. 733; DC. Prod. i. 474.
Solandra lobata, Cav. Diss. v. 279, t. 136, f. 1.

For an extensive synonymy see authors quoted.

Socotra. Near Tamarida and Galonsir. B.C.S. n. 150.

Distrib. East tropical Africa and India.

A species not far removed from the next mentioned one, *H. ternatus*, Mast., with which its resemblance is so close as to make it sometimes difficult to diagnose. The characters to be depended upon are its more robust habit and cream-coloured flowers, with beaked carpels exceeding the calyx. Seeds of this plant from Socotra germinated at Kew, and the plant flowered in 1881.

4. H. (Lagunæa) **ternatus**, Mast. (non. Cav.) in Oliv. Flor. Trop. Afr. i. 206.

Lagunæa ternata, Willd. Sp. iii. 733; DC. Prod. i. 474.

Socotra. Plains about Tamarida. B.C.S. 425. Schweinf. 297.

Distrib. Tropical Africa.

5. H. (Ketmia) **vitifolius**, Linn. Sp. 980; DC. Prod. i. 450; Mast. in Oliv. Flor. Trop. Afr. i. 197, and in Hook. Flor. Brit. Ind. i. 338; Cav. Diss. iii. 145, t. 58, f. 2.

Socotra. Common. B.C.S. n. 146. Schweinf. n. 665.

Distrib. Hotter parts of India, tropical Africa, Indian Ocean islands, and Australia.

6. H. (Ketmia) **Scotti**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 503. Tab. V. A.

Arborescens; foliis petiolatis ellipticis v. ovatis obtusis basi cordatis v. cuneatis, subtus pilis trifurcatis faciliter avulsis vestitis; floribus in racemos axillares solitarios breves paucifloros dispositis; calyce cyathoformi bracteolas 10 v. plures lineares trinervias liberas æquante; corolla magna; capsulis 5-valvis levibus; seminibus pilosis.

Arbor parva ramis erectis ramulisque terminalibus angulatis tomentosis. *Folia* petiolata elliptica v. ovata v. subrhomboidea 1½–2 poll. longa ¾–1¼ lata obtusa dentata v. crenata basi cordata v. cuneata palmatim 3–5-nervia hispida cum pilis sparsis supra stellatis subtus trifurcatis admixtis; petiolus tomentosus laminæ vix æquilongus. *Stipulæ* subulatæ. *Flores* in racemos 2–3-floros crassos breves solitarios axillares dispositi; pedunculi breves $\frac{3}{10}$ poll. longi tomentosi sub apice articulati; bracteæ caducæ. *Epicalycis* lobi 10 v. plures liberi lineares trinervii pubescentes calyci æquilongi. *Calyx* cyathoformis ½ poll. longus 5-lobatus lobis deltoideis acutis tubo æquilongis pubescentibus. *Corolla* lutea magna 2½ poll. longa 2½–2¾ poll. diam, extus basi trifurcatis setis vestita. *Columna* staminea per totum antherifera apice truncata. *Capsula* globosa v. late ovata ½ poll. diam. dimidio calyces persistentes excedentia, valvis 5 acutis levis ⅕ poll. latis. *Semina* plurima reniformia pilosa.

Socotra. On the hill slopes at considerable elevation. B.C.S. n. 705. Schweinf. nn. 535*a*, 535*d*.

Distrib. Endemic.

A very beautiful small tree, first found in flower by Scott, after whom I have named it, on the slope of Haghier near Adho Dimellus. The easily detached trifurcate hairs make it an unpleasant scrub plant. A distinct species of the section Ketmia, it finds its nearest allies in *H. Kirkii*, Mast. (in Oliv. Flor. Trop. Afr. i. 199), a Mozambique species, and in the widely spread tropical *H. panduriformis*, Burm. (Ind. 151. t. 47, f. 2; Mast. in Oliv. Flor. Trop. Afr. i. 203).

7. H. (Ketmia) **stenanthus**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 503. Tab. V. B.

Suffruticosus humilis; foliis cordatis obtusis dentato-crenatis pilis trifurcatis dense subtus vestitis; pedunculis unifloris curtis solitariis petiolum breviter excedentibus; calyce poculiformi dimidio bracteolas 8–12 lineares superante; corolla angusta.

Suffrutex ligneus prostratus ramis sæpe congestis ramulisque ultimis elongatis tomentosis. *Folia* petiolata ½–1½ poll. longa ⅜–¼ 1poll. lata cordata v. late cordato-rotundata obtusa dentato-crenata palmatim 5-nervia pilis stellatis suffulta et subtus pilis trifurcatis faciliter avulsis intermixtis; petiolus griseo-pilosus laminæ fere æquilongus. *Stipulæ* minutæ lineares.

Pedunculi uniflori curti ¼–½ poll. longi petiolum breviter excedentes in axillis solitarii sub apice articulati pubescentes et supra articulum stellatis pilis instructi. *Bracteolæ* 8–12 setaceæ minutæ liberæ ⅛ poll. longæ. *Calyx* poculiformis ⅜ poll. longus extus dense stellatim hirsutus 5-lobatus, lobis triangulari-acutis tubo triplo-brevioribus. *Corolla* lutea extus pilis trifurcatis vestita 1⅓ poll. longa in parte superiore patens 1⅓ poll. diam. sed petalis in parte inferiore in tubum angustum ¼ poll. diam. convolutis. *Columna* staminifera exserta versus apicem solum antherifera, vertice dentato anantherifera. *Ovarium* 5-loculare; stylus in ramos 5 capitato-stigmatosos divisus; ovula in loculis plurima. Cæt. ignot.

Socotra. On the limestone plateaux, at an elevation of over 1000 feet. B.C.S. 706. Hunter n. 2.

Distrib. Endemic.

A very distinct species. It grows as a dwarf, hard, woody under-shrub on the high limestone plains, and like other Socotran species is a disagreeable scrub plant, on account of its easily detached forked hairs. Its most marked feature is the convolution of the petals to form a narrow tube in their lower part, whilst above they are spreading.

8. H. (Ketmia) **malacophyllus**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 503.

Arborescens ramulis ferrugineo-tomentosis; foliis late ovatis obtusis dentatis crassis dense pubescentibus; pedunculis unifloris solitariis brevibus; bracteolis 10–12 liberis linearibus.

Arbor parva ramulis ultimis canaliculatis dense stellatim ferrugineo-tomentosis. *Folia* breviter petiolata 1¼–1½ poll. longa ¾–1 poll. lata late ovata obtusa dentata palmatim 3–5-nervia crassa mollissima dense stellatim pubescentia; petiolus pubescens lamina dimidio brevior. *Stipulæ* minutæ subulatæ. *Pedunculi* 1-flori in axillis solitarii. *Alabastri* per totum pubescentes; bracteæ 10–12 lineares liberæ.

Nom. Vern. Derafoo (B.C.S.). Derafaa (Schweinf.).

Socotra. Not abundant near Adho Dimellus. B.C.S. n. 488. Schweinf. nn. 535, 535 b, 535 c ?

Distrib. Endemic.

A species having a not remote affinity with the African *H. gossypinus*, Thunb. (Flor. Cap. 549; Mast. in Oliv. Flor. Trop. Afr. i. 205), which is, however, distinguished by its subcordate thick leaves, generally denser pubescence, and absence of brown setæ, while the epicalyx consists of shorter and stouter bracteoles.

Schweinfurth, under n. 535, sends specimens from several localities. Some of these are undoubtedly of *H. Scotti*, but some I take to be of a different species, and I believe may be referred to this one. I have not, however, in the description above incorporated any character derived from his specimens, as our specimens like his are few in number, and it is better to wait for further investigation of the flora before deciding the limits of the species. Schweinfurth considers all his specimens as being of one species.

9. Hibiscus sp.

We have foliage leaves and twigs of another species of Hibiscus from Socotra without flowers or fruit. We met with it in many parts of the island. It is a small tree with leaves, which vary considerably in form, densely covered with detachable trifurcate hairs. I have not been able to match our specimens with any known species. It is not unlike *H. Scotti* and *H. stenanthus*, and falls, according to Dr Masters, to whom I have shown the specimens, into the *Rosa-sinenis* section of the genus. Our material being so incomplete, I have not named this a species, but confine myself to giving a short description of our specimens :—

Arborescens ramulis ultimis tomentosis cum pilis trifurcatis interspersis ; foliis longe petiolatis deltoideis v. subrotundis palmatim 3-nerviis 2½–3½ poll. longis 1–1½ poll. latis crenato-incisis basi truncatis pilis trifurcatis faciliter avulsis subtus dense vestitis, petiolo sparsim griseo tomento tecto lamina duplolongiore ; stipulis linearibus deciduis.

Socotra. Abundant on the hill slope. B.C.S. n. 122.

6. GOSSYPIUM.

Gossypium, Linn. Gen. n. 845 ; Benth. et Hook. Gen. Pl. i. 209.

A genus of a few species of shrubby plants, generally cultivated in the tropics.

G. barbadense, Linn. Sp. 975 ; DC. Prod. i. 456 ; Mast. in Oliv. Flor. Trop. Afr. i. 210, and in Hook. Flor. Brit. Ind. i. 347 ; Wight Illustr. t. 28, A and B.

Socotra. Near habitations. B.C.S. 707.

DISTRIB. Cultivated generally in the tropics.

This is not, so far as I could discover, now cultivated in Socotra.

Order XIV. STERCULIACEÆ.

A large order dispersed over the old and new world, chiefly in the tropics, but a few genera have extra-tropical representatives. Two genera occur in Socotra, one spread all over the globe, though most abundant in tropical Asia, the other an old world tropical genus extending to Australia.

1. STERCULIA.

Sterculia, Linn. Gen. n. 1086 ; Benth. et Hook. Gen. Pl. i. 217.

A considerable genus of the warmer regions of the globe, with its head-quarters in tropical Asia.

S. Triphaca, R. Br. Pl. Jav. Rar. 228 ; Mast. in Oliv. Flor. Trop. Afr. i. 216.

S. abyssinica, R. Br. Pl. Jav. Rar. 227 pro parte; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 9, t. 2, B.

NOM. VERN. Boheng. Bohain (Wellst.).

Socotra. Common on the hills. B.C.S. n. 470. Schweinf. n. 758.

DISTRIB. East tropical Africa.

The Socotran specimens differ somewhat from the typical Abyssinian and Mozambique plant. The leaves are sharply five cleft with acuminate lobes, not rounded and three-lobed, and they are much larger than in type specimens, attaining sometimes a diameter of six inches. Again, the down on the flower panicles is not so coarse, but forms a somewhat velvety coating, both to the pedicels and also on the sepals themselves. In descriptions of the type, the calyx is said to be cleft into lobes through less than half its length, and Anderson's figure represents this. Now in our plant the cleaving extends deeper, to fully three-quarters of the length of the calyx, and on some Zambesi specimens, in Kew Herbarium, I find calyces equally deeply cleft. The follicles in the Socotra plant vary from two to five, and are somewhat larger than those in Kew Herbarium attached to the Mozambique plant, the *S. ipomœæfolia*, Garcke (in Peters Mossamb. 130), which is, as T. Anderson points out, unquestionably the *S. Triphaca* of Brown. The differences I have detailed are not sufficient to warrant a specific distinction being drawn, and there are in Kew Herbarium several specimens of the genus (as yet undetermined) from the African coast, which may well supply links to fill the small gaps at present observable between this insular and the continental forms.

The confusion that has arisen between *S. arabica*, T. Anders., *S. abyssinica*, R. Br., and *S. Triphaca*, R. Br., has been clearly explained by T. Anderson in his Aden Flora, which may be consulted on this point.

The Boheng or Bohain tree is a large one, attaining on Socotra often 30 feet in height. It is very abundant on the Haghier hills behind Tamarida. We did not obtain either flowers or fruit, but Schweinfurth was fortunate in getting both in May 1881, which have enabled an identification to be made.

Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 199), writes of the tree: "The Bohain tree is scarcely inferior in size to the Ukshare" (Odina ornifolia, Balf. fil.), "it has a broad leaf resembling the English sycamore, of which the camels and sheep are very fond.

2. MELHANIA.

Melhania, Forsk. Fl. Ægypt. Arab. 64; Benth. et Hook. Gen. Pl. i. 222.

A small genus of shrubs and under-shrubs growing in Africa, warmer Asia, and in Australia, but most abundant in Africa.

M. muricata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 503. Tab. VII., A.

Suffruticosa molliter tomentosa; foliis petiolatis variantibus ab formis linearibus ad ellipticas apice truncatis v. retusis sæpe apiculatis, crenato-serratis subtus glanduloso-punctatis; cymis bifloris; bracteolis cordato-reniformibus accrescentibus membranaceis; capsulorum loculis bispermis; seminibus muricatis.

Suffrutex lignosus ramosissimus. *Ramuli* patentes glanduloso-punctati molliter tomentosi. *Folia* diversiformia 1–1½ poll. longa ⅙–½ poll. lata linearia v. ovato-oblonga v. anguste elliptica crenato-serrata, basi 5-nervia apice truncata v. retusa sæpius apiculata, cano-tomentosa et glandulis fuscis subtus punctata; petiolus ⅕–⅔ poll. longus lamina brevior. *Stipulæ* setaceæ. *Cymæ* bifloræ axillares; pedunculis petiolis subæquilongis. *Involueri* lobi cordato-reniformes transverse latiores accrescentes. *Sepala* ovato-lanceolata. Petala obovata sepalis vix æquilonga. *Staminodia* linearia stamina æquantia. *Capsula* 5-locularia, loculis bispermis. *Semina* muricata glauca.

Socotra. Not uncommon near Galonsir. B.C.S. n. 330.

Distrib. Endemic.

This plant I at one time thought would fit in with the specific characters of *M. Denhami*, R. Br. (in Denh. et Capp. Voy. App. 233), a plant of Arabia and Scindh, which varies much in the size of its parts, and in the number of seeds in each cell of the fruit. But the Socotran plant presents several points of difference, being of much smaller habit, with leaves and branchlets less pronouncedly stellate-tomentose and very distinctly gland-dotted on the under side. These brown glands I only find faintly indicated on specimens in Kew Herbarium of *M. Denhami*. In form of leaf the Socotran plant varies from quite linear to elliptical, and these forms are seen on the half-dozen specimens we have. In none of the examples of *M. Denhami* is there such extreme variation In the flower, the petals in our plant are more nearly of the same length as the sepals, and are obovate rather than ovate. The capsule, too, equals in length the sepals, and contains seeds, two in each cell, which are glaucous and muricate, not brown and smooth. Boissier (Flor. Orient. i. 841), describing *M. bracteosa* (*Brotera bracteosa*, Guill. et Perr. Fl. Seneg. i. 86, t. 17, and *M. Kotschyi*, Hochst. in herb. Kotsch. Nub. sect. i. n. 219), which is the same plant as *M. Denhami*, writes of the seeds "punctatis." This feature is in the Arabian and African specimens in Kew Herbarium exceedingly obscure, and not like the strong murication of the Socotran plant. On account of all these differences I have regarded the Socotran plant as specifically distinct from *M. Denhami*, but it is not far removed, and exploration of the adjacent Arabian shores may discover forms uniting the two.

Order XV. TILIACEÆ.

A considerable order with a wide dispersion over the globe, chiefly tropical. It is represented in Socotra by three genera, of which one is entirely old world, another is chiefly old world, but absent from Africa and occurring in the Pacific Islands, and the third is found all over the world, both old and new.

1. GREWIA.

Grewia, Linn. Gen. n. 1026 ; Benth. et Hook. Gen. Pl. i. 233.

A considerable genus of herbs and trees widely spread in the warmer regions of the old world. Of the five species found in Socotra, two are endemic, and of the others, two are tropical African, south-west Asiatic, and Indian species, one of them reaching Mauritius ; the fifth is entirely Indian.

1. G. populifolia, Vahl Symb. i. 33 ; DC. Prod. i. 511 ; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 10 ; Boiss. Flor. Orient. i. 843 ; Mast. in Oliv. Flor. Trop. Afr. i. 246, and in Hook. Flor. Brit. Ind. i. 385.

G. betulifolia, Juss. in Ann. Mus. iv. (1804), 92, t. 50, f. 1.

Socotra. Not common. B.C.S. n. 97. Schweinf. n. 447 in fit.

Distrib. Tropical Africa and through Arabia to Afghanistan and India ; also Mauritius.

Like so many plants from similar habitats, it varies very greatly in its foliage. The form from Socotra is a small-leaved one with clustered branches.

2. G. orbiculata, Rottl. in Nov. Act. Nat. Cur. Berol. 1803, 205, ex Mast. in Hook. Flor. Brit. Ind. i. 386.

G. rotundifolia, Juss. in Ann. Mus. iv. (1804), 92, t. 50, f. 3 ; DC. Prod. i. 511 ; Wight Ic. t. 45.

Socotra. On the hill slopes. B.C.S. n. 680.

Distrib. Indian peninsula and perhaps Ceylon.

We obtained a plant in foliage-leaf only which we refer to this species.

3. G. salvifolia, Heyne in Roth. Nov. Spec. 239 ; DC. Prod. i. 509 ; Mast. in Oliv. Flor. Trop. Afr. i. 247, and in Hook. Flor. Brit. Ind. i. 386.

G. bicolor, Juss. in Ann. Mus. iv. (1804), 92, t. 50, f. 2 ; Boiss. Flor. Orient. i. 844.

Socotra. Not frequent on the hill slopes. B.C.S. n. 590.

Distrib. Tropical Africa and north-west and western India.

We obtained this variable plant in leaf only.

4. G. turbinata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 504.

Arborea ; foliis longe petiolatis ovato-lanceolatis basi obliquis serratis subtus incanis ; cymis trifloris oppositifoliis ; drupis turbinatis glabrescentibus nitidis, pyrenis 1-pluri-locularibus. Arbor circa 25-pedalis. *Ramuli* incani. *Folia* longe petiolata ovato-lanceolata basi 5-nervia serrata subtus incano-pubescentia 4–5 poll. longa 1–1½ poll. lata ; petiolus ¾ poll. longus pubescens sub lamina dilatatus. *Stipulæ* subulatæ. *Cymæ* trifloræ v. abortu unifloræ oppositifoliæ, pedunculis incanis petiolo brevioribus. *Flores* ignoti. *Drupæ* nonlobatæ turbinatæ $\frac{7}{10}$ poll. longæ in parte suprema $\frac{7}{10}$ poll. latæ 4-pyrenæ aureæ levæ pilis paucis adpressis vestitæ demum glabræ nitidæque ; pyrenæ 1-pluri-locularæ, loculis superpositis monospermis.

Nom. Vern. Eireit (B.C.S.). Ereik (Schweinf.).

Socotra. Amidst boulders at the sides of Keregnigiti. B.C.S. n. 373. Schweinf. n. 475.

DISTRIB. Endemic.

A small tree or small shrub in general appearance not unlike *G. salvifolia*, Heyne, but distinguished readily by its oppositifoliar inflorescence and large turbinate fruits. In well-developed fruits there are four stones, and each is usually multilocular (up to 6), but frequently, as is common in the genus, all the stones are not equally developed, and then the smaller ones have only one loculus. Neither Schweinfurth nor our party obtained flowers of this species. The inhabitants give to it the same name as to the next one.

5. **G. bilocularis**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 504.

Arborescens glabra; foliis breviter petiolatis magnis ovatis acutis basi cordatis æquilateralibus; cymis bifloris fere oppositifoliis; pedunculis petiolo subæquilongis; drupis 4-pyrenis 4-lobatis subcubicalibus glabrescentibus nitidis; pyrenis bilocularibus.

Arbor parva ramulis glabris. *Folia* magna $4\frac{1}{2}$–7 poll. longa $2\frac{1}{4}$–$3\frac{1}{4}$ poll. lata ovata acuta basi 5-nervia cordata, crenato-serrata subcoriacea pilis paucis adpressis dispersis subtus vestita cæteroquin glabra; petiolus $\frac{2}{5}$–$\frac{3}{5}$ poll. longus subpilosus sub lamina expansus. *Cymæ* bifloræ v. abortu 1-floræ suboppositifoliæ rhachi pedunculisque subincanis petiolo subæquilongis. *Flores* ignoti. *Drupæ* 4-lobatæ $\frac{2}{3}$–$\frac{4}{5}$ poll. diam. subcubicales aureæ nitidæ siccæ subrugosæ glabrescentes basin filamentis staminum marcidis cinctæ; pyrenæ biloculares, loculis superpositis monospermis.

NOM. VERN. Eireit (B.C.S.).

Socotra. Near Adona, at an elevation over 3000 feet. B.C.S. nn. 498, 516.

DISTRIB. Endemic.

Species of this genus are in the dried condition notably hard to identify, and, as Masters has pointed out, the synonymy is most complex and the whole genus wants revision. Nevertheless this plant and the preceding are so very marked, and their characters are so unconformable with those of any described species, that I have, although our specimens are incomplete, named them as novelties.

The present species finds its nearest ally in *G. bracteata*, Roth. (Nov. Spec. 243), a plant of the Carnatic and Ceylon, from which its nearly glabrous leaves and fruits on almost oppositifoliar axes separate it. It is a rare plant in Socotra; we have it from only one locality.

This plant frequently sends out adventitious twigs (n. 516) bearing very small leaves, often hardly $\frac{1}{4}$ inch in diameter, somewhat cordate, deltoid in form with prominent dentations, the teeth and margin being coloured dark purple, the rest of the leaf green, and the whole being very hairy. Thus the plant is heterophyllous. Schweinfurth sends specimens with this character, which he refers to his n. 475, which is *G. turbinata*, but I doubt if this is correct, and think his specimens are really like ours from *G. bilocularis*.

2. CORCHORUS.

Corchorus, Linn. Gen. n. 675; Benth. et Hook. Gen. Pl. i. 235.

An extensive genus widely dispersed in the tropics. Of the three Socotran species one is endemic, one is south-west Asiatic and tropical African, and one is a wide-spread tropical species.

1. C. acutangulus, Lamk. Dict. ii. 104.; DC. Prod. i. 505; Mast. in Oliv. Flor. Trop. Afr. i. 264, and in Hook. Flor. Brit. Ind. i. 398; Wight Ic. t. 739.

Socotra. Not uncommon on the plains. B.C.S. n. 457. Schweinf. n. 692.

Distrib. Tropical Africa and Asia, West Indies and Australia.

2. C. Antichorus, Ræuschel Nomencl. Bot. ed. iii. 158, ex T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 10; Boiss. Flor. Orient. i. 846; Mast. in Oliv. Flor. Trop. Afr. i. 263, and in Hook. Flor. Brit. Ind. i. 398.

Antichorus depressus, Linn. Mant. 64; DC. Prod. i. 504; Franch. Sert. Somal. in Miss. Révoil. 21. *C. humilis*, Munro; Wight Ic. t. 1073.

Socotra. Common on dry plains. B.C.S. n. 591. Schweinf. n. 308 in lit.

Distrib. Northern India, Arabia, and tropical Africa, reaching the Cape de Verde Islands.

3. C. erodiodes, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 504. Tab. VII., B.

Perennis depressus; foliis diverse pinnatisectis longe petiolatis; pedunculis longis unifloris extra-axillaribus; sepalis petalisque quatuor; staminibus pluribus; stylis elongatis; capsulis rectis v. parum curvatis brevibus pubescentibus bilocularibus bivalvis.

Herba perennis ramis plurimis tenuibus rosulatis depressis patentibus fere 1-pedalibus. *Folia* conferta longe petiolata $1\frac{3}{4}$–$3\frac{3}{4}$ poll. longa $\frac{1}{3}$–$\frac{3}{4}$ poll. lata oblonga v. obovato-oblonga v. ovato-oblonga, lamina serrata v. pinnatifida lobis serratis v. bipinnatisecta laciniis angustis basi cordata v. subhastata ciliata pilisque paucis sparse vestita v. pubescenti; petiolus 1–2 poll. longus basi subamplexicaulis. *Stipulæ* angustæ subulatæ. *Pedunculi* solitarii uniflori $\frac{1}{2}$–$\frac{3}{4}$ poll. longi lateraliter extra-axillares puberuli demum recurvi. *Alabastri* obovati dense pilosi. *Sepala* 4 oblanceolato-oblonga v. oblonga apice concava $\frac{1}{4}$ poll. longa 3–5-nervia nervo medio superne incrassato reticulato-venulosa extus pilis reflexis adpressis vestita. *Petala* obovata sepalis æquilonga. *Stamina* plura sepalis æquilonga; antheræ biloculares, loculis parallelibus. *Ovarium* biloculare. *Stylus* longus staminibus æquilongus a basi sursum dilatatus. *Capsula* breviter siliquæformia $\frac{1}{5}$–$\frac{1}{3}$ poll. longa bivalva paullo rostrata recta v. subcurvata subpubescentia. *Semina* in quoque loculo plura irregulariter angulata.

Socotra. Abundant on the sandy plains near Galonsir and Tamarida. B.C.S. n. 48. Schweinf. nn. 381, 726. Boivin. n. 1041.

Distrib. Endemic.

A very curious species, quite distinct from all others. At first one would hardly recognise it as belonging to this genus, but it only varies from the generic character in the long style and delicate herb-like habit. Its nearer allies are found in two Cape species, *C. asplenifolius*, Burch. (Harv. and Sond. Flor. Cap. i. 229), a woody plant with glabrous shortly stalked crenate-serrate leaves and long linear capsules, and *C. serræfolius*, Burch. (Harv. and Sond., *loc. cit.*), which in habit resembles the last-mentioned and has six-valved muricate capsules. Like so many plants of sandy desert spots this species is slightly variable. In some examples the leaves are very longly petiolate and almost entire, whilst in others they are deeply cleft with narrow laciniæ. It is a very common plant on the plains, with its leaves spread out in a rosette and studded with yellow flowers. The peduncles in fruit are always recurved, and thus bury the fruit in the sand beneath the bases of the leaf stalks. This is one of the plants brought from Socotra by Boivin, and now in the Museum of Natural History at Paris.

3. ELÆOCARPUS.

Elæocarpus, Linn. Gen. n. 663; Benth. et Hook. Gen. Pl. i. 239.

A considerable genus of the old world tropics, the South Pacific, and Australia; absent from Africa, but two or three species occur in Madagascar and the Mascarene Islands.

E. transultus, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 504.

Arbor alta resinifera ramis terminalibus crassis cicatricosis; foliis versus apices ramorum aggregatis lanceolatis elongatis apice basique angustatis obtusis integris subundulatis subobliquis fere 6 poll. longis 2 poll. latis breviter petiolatis sparsim stellatim-tomentosis subtus pallidioribus venulis prominulis, petiolo dense tomentoso $\frac{5}{12}$–$\frac{1}{2}$ poll. longo; stipulis ovatis caducis; floribus ignotis; racemis fructiferis $1\frac{3}{4}$–2 poll. longis paucicarpicis, pedicellis $\frac{1}{6}$ poll. longis; drupis ellipticis $\frac{1}{3}$ poll. longis glabris, pyrenis bilocellatis extus tuberculatis.

Nom Vern. Kenhar (B.C.S.).

Socotra. On the hills about Galonsir and Tamarida. B.C.S. nn. 267, 409.

Distrib. Endemic.

Our specimens of this plant are unfortunately imperfect, and do not admit of a complete description being given, but the fruiting racemes permit of no doubt as to the identification of the plant as a member of this genus. It is quite a distinct species, falling into the *Dicera* group, amongst the members of which, however, it is not usual to find the leaves aggregated at the ends of the branches as in our plant.

It is interesting to obtain a representative of this genus in Socotra, as it connects its Indian distribution with that in the Mascarene Islands and Madagascar. It is worthy of note that the genus is not African.

Order XVI. LINEÆ.

A small order spread over the whole world. One, almost cosmopolitan, genus is represented in Socotra.

LINUM.

Linum, Linn. Gen. n. 389; Benth. et Hook. Gen. Pl. i. 242.

A considerable genus of temperate and warmer regions of the world, with a few tropical species in America. The majority of them belong to the Mediterranean region.

L. **gallicum**, Linn. Sp. 401; DC. Prod. i. 423; Boiss. Flor. Orient. i. 851; Sibth. Flor. Græc. t. 303.

Socotra. A common plant on the hill slopes at an elevation of over 1000 feet. B.C.S. n. 609.

Distrib. Mediterranean region, extending eastward to Persia.

Order XVII. MALPIGHIACEÆ.

A large tropical American order, with some extra-tropical forms, and a few representatives in Asia and Africa. The Socotran genus is exclusively old world.

ACRIDOCARPUS.

Acridocarpus, Guill. et Perr. Fl. Seneg. i. 123, t. 29; Benth. et Hook. Gen. Pl. i. 256.

A small genus of species, limited in distribution to tropical and south Africa, Madagascar, and Arabia.

A. **orientalis**, Ad. Juss. Mon. Malpigh. 234.

A. ? sp. nova. Oliv. Flor. Trop. Afr. i. 279.

Socotra. Abundant on the Haghier hills. B.C.S. n. 272. Schweinf. n. 454. Nimmo.

Distrib. Arabia.

A very handsome and showy small tree, with glossy foliage and long racemes of yellow flowers. Hitherto this plant has only been found by Aucher Eloy in the vicinity of Muscat, and from his specimens Jussieu described the species. Nimmo's plant in Kew Herbarium, which is as usual labelled "Red Sea," and is so referred to by Oliver, is fragmentary and much insect eaten. Oliver doubted its being this species, and conjectured it might be a variety of *A. natabitus*, Juss., or a new species. Our specimens show that it is really *A. orientalis*, the foliage characters, as well as the length of racème, which are the main points of difference between Nimmo's specimens and the type, being variable.

On comparing our plants with those of Aucher Eloy and with Jussieu's description, we find one or two points wherein emendation may be made, and as Schweinfurth obtained very fine fruit (we only have flowers) I am able to complete the specific description which has been deficient in that character. Jussieu describes the leaves as "oblonga lanceolato-obovata $2\frac{1}{2}$–$1\frac{1}{2}$ poll. longa $1\frac{1}{4}$–$\frac{3}{4}$ poll. lata." Whilst this typical form is found in leaves of Socotran plants, yet they are at times quite oval or oblong-oval with a subcuneate base, and may reach three inches in length. In the flowers I find all the sepals invariably "in margine glandula minuta rubenti impressa." The petals too are about two-and-a-half times the length of the sepals, and the filaments of the stamens are almost equal in length to the sepals, so that the anthers project beyond them. Of the fruit and seeds the following is a description:—*Samaræ* tres oblongæ receptaculo trigono-conico aucto applicitæ, lateribus rufescente-tomentosis, supra extrorsumque in alam puberulam cum pilis rufis productæ 1 poll. longæ $\frac{7}{12}$ poll. latæ margine antico subincrassato vix curvato integro, postico tenuiore subsinuato et curvilineari. *Semina* subdolabriformia, testa membranacea.

Order XVIII. ZYGOPHYLLEÆ.

A small order, chiefly found in desert and maritime districts of the tropical and subtropical regions of the old and new world. The three genera found in Socotra have a wide distribution, one of them, however, being limited almost entirely to the old world.

1. TRIBULUS.

Tribulus, Linn. Gen. n. 532; Benth. et Hook. Gen. Pl. i. 264.

A small genus of very variable species, widely dispersed in the warm regions of the world, and reaching Europe and North America.

T. terrestris, Linn. Sp. 554; DC. Prod. i. 703; Boiss. Flor. Orient. i. 902; Oliv. Flor. Trop. Afr. i. 283; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 423; Franch. Sert. Somal. in Miss. Révoil 22; Sibth. Flor. Græc. t. 372.

T. mollis, Ehrenb. in Schweinf. Flor. Æthiop. 29.

Socotra. Common on the plains. B.C.S. nn. 92, 222. Schweinf. n. 383 in lit.

Distrib. A wide-spread tropical weed.

We have on Socotra two distinct forms of this plant. One, the type, with the shortly pedicellate flowers and the slightly hairy fruits. The other (n. 222) which in a less variable plant might be almost a distinct species, has very long pedicels, and the fruit is densely hispid. It resembles most nearly Schweinfurth's central African plant, named *Tr. mollis* by Ehrenberg.

2. ZYGOPHYLLUM.

Zygophyllum, Linn. Gen. n. 530; Benth. et Hook. Gen. Pl. i. 266.

A considerable old-world genus, having its headquarters at the Cape and in Australia, and in the saline regions and deserts of western Asia and north Africa. Both Socotran species have a wide distribution.

1. Z. simplex, Linn. Mant. 68; DC. Prod. i. 705; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 13; Boiss. Flor. Orient. i. 912; Oliv. Flor. Trop. Afr. i. 285; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 424.

Z. portulacoides, Forsk. Fl. Ægypt. Arab. 88, t. xii, B.

Socotra. Common on the plains. B.C.S. n. 660.

Distrib. Deserts from Cape de Verde Islands through north tropical Africa and Arabia to Scindh; also Cape of Good Hope.

2. Z. album, Linn. fil. Dec. i. t. 6; DC. Prod. i. 706; Boiss. Flor. Orient. i. 915; Oliv. Flor. Trop. Afr. i. 286; Sibth. Flor. Græc. t. 371.

Socotra. On sandy spots near the shore at Galonsir and elsewhere. B.C.S. n. 112.

Distrib. Same as the last species, but not spreading so far eastwards.

3. FAGONIA.

Fagonia, Linn. Gen. n. 531; Benth. et Hook. Gen. Pl. i. 267.

A small genus of very variable species, having a world-wide distribution.

F. cretica, Linn. Sp. 553; DC. Prod. i. 704; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 11; Boiss. Flor. Orient. i. 905; Oliv. Flor. Trop. Afr. i. 287; Bot. Mag. t. 241.

var. **arabica**, T. Anders. (*loc. cit.*); Oliv. (*loc. cit.*).

F. arabica, Linn. Sp. 553; DC. Prod. i. 704; Boiss. Flor. Orient. i. 907; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 425.

Socotra. Common everywhere on the plains. B.C.S. n. 93. Nimmo.

Distrib. Of the species—cosmopolitan. Of the variety—Egypt and Arabia.

Another of the plants sent home by Nimmo.

var. **socotrana**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Omnino inarmata glauca ramis striatis scabrido-hispidis; foliis unifoliatis crassis ovato-ellipticis v. ellipticis v. rotundatis v. suborbicularibus $\frac{2}{3}$–$1\frac{1}{6}$ poll. longis $\frac{5}{12}$–$\frac{5}{6}$ poll. latis; stipulis minutis $\frac{1}{12}$ poll. longis subulatis submembranaceis; pedunculis sub capsulis dilatatis et eis subæquilongis; sepalis subpapillosis; petalis albidis v. purpureis; capsulis pubescentibus; seminibus obsolete punctulatis.

Socotra. Abundant. B.C.S. n. 202.

Distrib. Endemic.

Certainly, placed alongside typical *F. cretica*, this appears a very distinct species. But with Anderson and Oliver I am driven to regard *F. cretica* as a protean species with its variations more or less constant, yet so gradually merging one into the other as to render specific diagnoses hardly possible. This Socotran form has a strong individuality, more than in any other one of the numerous forms which have been regarded as species by authors. Its main features are the persistently unifoliate leaves, which are large and fleshy, and its stipules, reduced to small somewhat membranous scales, never showing a trace of spines. By any one who regards *F. cretica*, as referred to here, an aggregation of species, our plant will of necessity be considered a distinct species, and with more reason than can be advanced in support of the constitution of many of the frequently described species.

Order XIX. GERANIACEÆ.

A considerable order, found chiefly in temperate regions but with representatives all over the globe. There are three genera in Socotra, two having many species and with the distribution of the order; the third is endemic and monotypic, with extremely interesting South American alliances.

1. GERANIUM.

Geranium, Linn. Gen. n. 832; Benth. et Hook. Gen. Pl. i. 272.

A large genus widely spread in temperate regions, especially in the northern hemisphere, and within the tropics occurring in mountainous districts.

G. mascatense, Boiss. Diagn. ser. 1, i. 59, and Flor. Orient. i. 882.

Socotra. On the hills near Galonsir. Common. B.C.S. n. 242.

Distrib. Arabia.

A species founded by Boissier on specimens collected by Aucher Eloy on hills near Muscat. Specimens are in Kew Herbarium from north Midian brought by Burton, and now it turns up in Socotra.

It is nearly allied to *G. molle*, Linn. (Sp. 955), but sufficiently separated, as Boissier points out, by the more deeply cut leaves with acute laciniæ and by the rugose non-reticulate fruit valves. Another point of difference lies in the corolla. In *G. molle* the petals are obcordate, only slightly longer than the sepals, the corolla of *G. mascatense* was unknown to Boissier, and as it has not been described I give its characters :—"petalis purpureo-nervosis minutissime unguiculatis obovatis supra basin ciliatis calyce fere duplo longioribus." The petals are altogether narrower and longer than in *G. molle*.

2. DIRACHMA.

Dirachma, Schweinf. in Proc. Roy. Soc. Edin. xiii. (1883).

Flores regulares. Calyx 8-partitus, lobis valvatis. Petala 8, perigyna, imbricata. Glandulæ disci inconspicuæ. Stamina 8, libera, petalis opposita, omnia antherifera ; antheræ magnæ oblongæ. Ovarium 8-lobum, 8-loculare, rostratum ; stylus centralis integer, obtusus ; ovula in loculis solitaria, adscendentia. Capsula 8-loba in carpella 8 ventraliter dehiscentia intus lanata secedentia. Semina compressa, in loculis solitaria ; testa nitida ; albumen sparsum.—Frutex ramosus plusminusve pubescens. Folia alterna, dentato-serrata, paullo revoluta, stipulata. Pedunculi axillares, 1-flori. Flores albi. Calyx 4-bracteatus.

An extremely interesting monotypic and endemic genus, the nearest affinity of which is somewhat puzzling; but I think its position in this family is most satisfactory. We obtained several specimens of the plant, but without flower, and it is owing to Schweinfurth's beautiful flowering specimens that I have been able to determine its relationship. Its general habit is that of Tiliaceæ, but its imbricate petals, and the definite stamens are features hardly reconcilable with its position in that family. Sterculiaceæ might almost claim it, and indeed there is no character forbidding its inclusion in the family, though the free perigynous stamens are exceptional. With Samydaceæ and allied calycifloral orders there are very strongly marked affinities, but the solitary ascending ovule seems to exclude it. In Geraniaceæ it appears to me to find its most natural neighbours in the tribes *Vivianieæ* and *Wendtieæ*. Technically it does not exactly fit into either as at present constituted: from the former its alternate leaves, solitary ovule, and bracteolate calyx, amongst other points, separate it; from the latter its valvate sepals is an easily ascertained diagnostic mark. But the general facies of the plant with the sum total of its technical characters mark its near alliance with the small South American (Chili and Peru) monotypic genera *Wendtia* and *Balbisia*, and with the somewhat larger genus *Viviania*, and in their vicinity I therefore place it. This, it will be observed, is a very noteworthy generic affinity, and there are others of like character in the flora of the island which are referred to under the respective genera (see *Thamnosma*, *Cœlocarpum*).

Such an antipodean relationship is not a peculiar feature in the Socotran flora, but, as is pointed out in the Introductory Chapter, is characteristic of the islands in the Indian Ocean. But I may here specially direct attention to the resemblances which this plant bears to the Samydaceæ and allied orders; for in the monotypic *Mathurina*, endemic in Rodriguez, with a Central American affinity, we have a Turneraceous genus which, as I have elsewhere pointed out, (Proc. Linn. Soc. xv. (1877), 162), has many characters of the Samydaceæ. And thus two genera, each endemic in an Indian Ocean island and belonging to the same alliance of plants, present the same special features in the distribution of their immediate allies.

As without Schweinfurth's specimens it would have been impossible to determine this plant, I applied to him for a generic name, and he suggested the local name for the plant which I have adopted, ascribing the genus to Schweinfurth.

D. socotrana, Schweinf. in Proc. Roy. Soc. Edin. xiii. (1883). Tab. VIII.

Frutex 10-pedalis ligno odorato ramulisque juvenilibus pubescentibus rectis rigidis, interdum humilis tenuiter et intricato-ramosus. *Folia* $\frac{3}{4}$–$1\frac{1}{4}$ poll. longa $\frac{1}{3}$–$\frac{2}{3}$ poll. lata, in plantis humilibus multo minora vix $\frac{1}{6}$ poll. longa, breviter petiolata, ad ramulos laterales contractos aggregata, oblonga v. obovato-oblonga apice truncata emarginata v. triangulari-dentata basi cuneata, margine dentato-serrata, puberula; petiolus $\frac{1}{6}$–$\frac{1}{5}$ poll. longus. *Stipulæ* $\frac{1}{6}$ poll. longæ subulatæ pubescentes persistentes. *Flores* solitarii pedunculis pubescentibus fere $\frac{1}{2}$ poll. longis. *Epicalycis* lobi lanceolati pubescentes $\frac{1}{4}$ poll. longi. *Calyx* extus dense pubescens tubo $\frac{1}{3}$ poll. longo, limbi lobis purpurascentibus $\frac{1}{2}$ poll. longis angustibus fere linearibus ultime reflexis deciduis. *Petala* oblanceolata obtusa calycis lobis æquilonga basi attenuata intusque glandula villosa instructa calycis tubum inserta. *Stamina* calyci affixa petalis breviora, filamentis subulatis; antheræ lateraliter dehiscentes. *Ovarium* pubescens calyce inclusum. *Fructus* $\frac{1}{3}$ poll. longus obcordatus v. late ovatus angulatus dense pubescens atque pilis validis glanduloso-capitatis instructus, carpellorum maturûm marginibus intus densè lanatis. *Semina* glabra.

Nom. Vern. Dirachma or Rachman (Schweinf.).

Socotra. On the slopes of Haghier; not uncommon. B.C.S. nn. 285, 344. Schweinf. n. 528.

Distrib. Endemic.

The only species of the genus is a sweetly-scented plant, and it presents some variation in the size of leaves and branches. Sometimes it forms very shortly and completely branched plants, on which the leaves are very small, sometimes only a couple of lines in diameter; and even on the normally developed plants, with longer rigid twigs, one often finds leaves very small and inconspicuous amongst the larger ordinary ones.

3. OXALIS.

Oxalis, Linn. Gen. n. 582; Benth. et Hook. Gen. Pl. i. 276.

A large genus, with headquarters in South America and south Africa, but including some cosmopolitan weeds.

O. corniculata, Linn. Sp. 623; DC. Prod. i. 692; Boiss. Flor. Orient. i. 866; Oliv. Flor. Trop. Afr. i. 296; Edgew. and Hook. fil. in Hook. Flor. Brit. Ind. i. 436; Wight Ic. t. 18.

Socotra. Common weed. B.C.S. n. 608.

Distrib. Cosmopolitan weed.

Order XX. RUTACEÆ.

A large order, spread over temperate and warmer regions of the whole world, but attaining a maximum in south Africa and Australia. Of the three genera found in Socotra, two are old-world genera with species often cultivated, and the third is otherwise only known in two species from Texas and California.

1. RUTA.

Ruta, Linn. Gen. n. 523; Benth. et Hook. Gen. Pl. i. 286.

A considerable genus, characteristic of the Mediterranean region and Atlantic islands, and sparingly spread in western and central Asia.

R. graveolens, Linn. Sp. 548; DC. Prod. i. 710; Boiss. Flor. Orient. i. 921; Oliv. Flor. Trop. Afr. i. 304; Hook. fil. Flor. Brit. Ind. i. 485.

var. angustifolia, Hook. fil. (*loc. cit.*).

R. angustifolia, Pers. Synops. i. 464; Wight and Arn. Prod. 146.

Nom. Vern. Shedah (B.C.S.).

Socotra. Near Tamarida. B.C.S. n. 434.

Distrib. From the Canary Islands to Scindh.

Probably an escape in Socotra.

2. THAMNOSMA.

Thamnosma, Torr. et Frém. in Frémont 2nd Rep. (1845), 313, and Bot. Whipple Exp. 17, t. 3; Benth. et Hook. Gen. Pl. i. 288.

A tritypic genus, which has been hitherto known from the new world only, and there represented by two species, one, *T. montana*, on which Torrey and Frémont founded the genus brought from mountain passes in California, and obtained later by Bigelow during the Whipple Expedition; the other, a Texas and north Mexico plant, described and figured by Gray (Sprague and Gray Gen. Ill. ii. 143, t. 155) as *Rutosma texana*. It is a fact of no little interest to find a third species turning up on the hills of Socotra, nor is it any the less so when we find that besides the genus *Peganum* represented by one species, this is the only genus of the true Rues found in the new world, and the only one indigenous in Socotra. The genus is a very distinct one, marked by its peculiar papulose appearance and simple leaves, and separated from all the Ruteæ by its 8-lobed disk and the bicarpellary ovary. The Socotran species necessitates an emendation of the generic character, to the extent that the ovary is sometimes sessile, not always stipitate. In Kew Herbarium is a plant from the Transvaal, collected by Dr Atherstone, which is not far removed from this genus. The floral characters are alike, and the general glandular papulose covering is present. It differs, however, in the leaves, which are compound, not simple.

Whether or no the generic character can be extended to include this plant remains for futher discovery to determine, for there are but a few fragments of the plant in Kew Herbarium. But its existence only increases the interest attaching to the Socotran plant, and illustrates further the intimate relation between the south African and the Socotran floras.

This is the only instance in the flora of a small and well-marked genus with Antipodean representation, but we have, as has been already noticed, instances of endemic genera whose nearest allies are genera of limited new-world distribution. *Dirachma* amongst Geraniaceæ has been mentioned, and we shall find amongst Verbenaceæ a distinct genus, *Cœlocarpum*, very closely allied, almost congeric with a genus restricted to Bolivia, Brazil, and Mexico, all reminding us, as is set forth in the Introductory Chapter, of like features observed in the floras of other Indian Ocean islands.

T. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 505. Tab. VI, B.

Suffruticosa graveolens glanduloso-papulosa; foliis oblanceolatis v. anguste obovatis; floribus solitariis extra-axillaribus; ovario sessili; seminibus longe muricatis.

Suffrutex ramosus glaber omnino glanduloso-papulosus graveolens. *Folia* $\frac{2}{3}$–1 poll. longa $\frac{1}{8}$–$\frac{1}{6}$ poll. lata simplicia conferta anguste oblonga v. obovata v. oblanceolata obtusa basi attenuata margine revoluta integra crassa. *Pedunculi* uniflori solitarii extra-axillares v. subaxillares $\frac{1}{5}$ poll. longi. *Sepala* 4 subrotundata $\frac{1}{12}$ poll. longa. *Petala* 4 oblongo-elliptica $\frac{1}{5}$ poll. longa. *Stamina* 8 petalis breviora, antheris suborbicularibus apiculatis. *Discus* crenato-lobatus. *Ovarium* sessile. *Capsula* $\frac{1}{3}$ poll. longa. *Semina* 5–6 reniformia, lateribus levibus dorso longe muricatis $1\frac{1}{2}$ poll. longa.

Nom. Vern. Fighen (Schweinf.).

Socotra. On the Haghier hills, at an altitude over 1500 feet. B.C.S. n. 395. Schweinf. n. 619.

Distrib. Endemic.

Our plant is very strongly odorous, and its leaves are somewhat broader than in the new world plants, and it is also distinguished from them by its solitary flowers, forming a short raceme at the end of the branches, not arranged in lateral racemes, and by its completely sessile ovary. The muricate seeds are only present in the Mexican species; in the Californian one they are smooth.

3. CITRUS.

Citrus, Linn. Gen. n. 901; Benth. et Hook. Gen. Pl. i. 305.

A small genus endemic in tropical Asia; but the species are met with cultivated and as escapes all through the tropics.

C. aurantium, Willd. Sp. iii. 1427; Hook. fil. Flor. Brit. Ind. i. 515.

Socotra. On the hills at Adho Dimellus, and also near Feraigeh. B.C.S. n. 603.

We saw a few trees only on the island.

Order XXI. BURSERACEÆ.

A small order of balsam-producing trees or shrubs, inhabiting tropical regions in both the old and new worlds. The two perhaps best known genera of the order, *Boswellia* and *Balsamodendron*, are represented in Socotra, and there probably more copiously than in any other area of like extent. Both genera are restricted in distribution to Africa and western Asia, *Boswellia* having the more limited range.

1. BOSWELLIA.

Boswellia, Roxb. Pl. Corom. iii. 4, t. 207; Benth. et Hook. Gen. Pl. i. 322.

A small genus of trees, including five species besides the Socotran ones. They are distributed in Nile Land and Somali Land, and one species has a wide range in northern India and the Indian peninsula. On Socotra there are three species endemic, and possibly there is a fourth.

1. B. Ameero, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 505; Engl. in DC. Monog. Phanerog. iv. (1883), Addit. 536. Tab. IX.

Arborea cortice papyraceo; foliis magnis multifoliolatis pubescentibus rhachi tereti, foliolis subsessilibus oblongo-ellipticis obtusis crenato-dentatis subrevolutis; racemis densis foliis multo brevioribus, pedicellis longis flores excedentibus; capsulis 4–5-gonis turbinatis breviter stipitatis.

Arbor balsamiflua cortice papyraceo rumpente. *Rami* terminales crassi. *Folia* 11–16 poll longa impari-multifoliolata (11–19) ad apices ramorum conferta, rhachi pubescente; foliola subopposita subsessilia 2–3½ poll. longa ¾–2¼ poll. lata oblongo-elliptica v. rarius anguste oblonga, basi obliqua subrotundata, apice obtusa, irregulariter crenato-dentata venoso-reticulata pubescentia. *Racemi* densi breves 1¾–3 (rarius 4) poll. longi vix ramosi axillares, rhachi paullo pubescente; pedicelli ½ poll. longi pubescentes floribus multo longiores. *Flores* precoces expansi $\frac{5}{12}$ poll. diam. *Calycis* lobi incrassati minuti deltoidei concavi persistentes. *Petala* 5 interdum 6 ovata v. oblongo-ovata acuta ¼ poll. longa ⅕ poll. lata subtiliter velutina rosea. *Stamina* purpurea petalis vix æquilonga, filamentis subulatis subcomplanatis papillosis ad medium disci extus insertis; antheræ filamentis dimidio breviores oblongæ sparsim puberulæ. *Discus* purpureus glaber persistens 5-lobatus, lobis paullo concavis. *Ovarium* glabrum stipitatum (stipite quadrangulari) 4–5-lobatum 4–5-(rarissime 3-)loculare sursum angustatum in stylum tetragonum crassum stigmate spongioso subtetragono terminantem. *Capsula* turbinata 4–5-(rarissime 3-)gona $\frac{5}{12}$ poll. longa ⅓ poll. lata glabra, endocarpio albido 4-cornuto.

Nom. Vern. Ameero (B.C.S.). Hammira (Schweinf.). Amaro (Wellst.).

Hab. Socotra. On the slopes of the Haghier hills about Tamarida; also about Homhill. Abundant. B.C.S. nn. 394, 565. Schweinf. n. 540. Hunter n. 19.

DISTRIB. Endemic.

This is the chief gum-resin producing tree of the island, and is a thoroughly distinct species. Its nearest allies appear to be the Abyssinian and Æthiopian *B. papyrifera*, Ach. Rich. (Tent. Flor. Abyss. i. 148, t. 33), and the Somali Land *B. Carterii*, Birdw. (in Trans. Linn. Soc. xxvii. (1871), 143), but from both of them its short, dense inflorescences separate it. Its fruits are much more shortly stalked than those in the first mentioned, and have a different outline from those of the latter.

I have named the species from the native name. Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 172) speaks of it as the "Amaro-tree," and says "when branches are broken they smell strongly of turpentine, but the camels are notwithstanding exceedingly fond of them." The gum-resin is obtained by making incisions in the bark, when a white viscid substance exudes, which when hardened is collected in goat skins. So far as we could learn this is not much exported or used. For further discussion of the subject of the gum-resin and the structure of the plant, see Appendix and Introductory Chapter.

2. **B. elongata**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 505; Engl. in DC. Monog. Phanerog. iv. (1883), Addit. 537. Tab. X.

Arborea cortice papyraceo; foliis magnis multifoliolatis rhachi tereti tomentosa, foliolis sessilibus elongato-oblongis obtusis crenato-serratis revolutis; racemis ramosis elongatis foliis fere duplolongioribus, pedicellis crassis floribus brevioribus; capsulis maturis non visis.

Arbor balsamiflua cortice papyraceo rumpente. *Rami* terminales crassi. *Folia* 9–14 poll. longa impari-multifoliolata (15–20) ad apices ramorum conferta rhachi tomentoso-pubescente; foliola subopposita v. alterna sessilia $1\frac{1}{2}$–$3\frac{3}{4}$ poll. longa $\frac{1}{2}$–$\frac{5}{6}$ poll. lata elongato-oblonga sæpe multo angustata basi subdilatata obliqua et rotundata v. subcordata, apice obtusa v. late acuta margine revoluta serrato-crenata supra glabra nitida subtus griseo-tomentosa venulis primariis prominulis. *Racemi* tomentosi elongati usque ad 15 poll. ramosi, ramis inferioribus elongatis, superioribus brevibus; bracteolæ parvæ inferiores subfoliaceæ integræ, superiores lineares minutæ; pedicelli breves $\frac{1}{8}$–$\frac{1}{6}$ poll. longi canaliculati 4-angulares crassi floribus subæquilongi v. breviores. *Flores* expansi $\frac{2}{3}$ poll. diam. *Calycis* lobi deltoidei persistentes. *Petala* oblonga subobtusa apice subincrassata inflexa $\frac{3}{10}$ poll. longa subtiliter velutina alba. *Stamina* petalis breviora, filamentis lineari-acutis complanatis papillosis striatis ad basin disci extus insertis; antheræ filamentis vix dimidio breviores sparsim puberulæ. *Discus* cupuliformis vix undulatus glaber. *Ovarium* quadrangulari-stipitatum tetragonum 4-loculare glabrum in stylum crassum tetragonum sursum angustatum, stigmate spongioso capitato. Fruct. mat. non vidi.

Socotra. On the hill slopes; not uncommon. B.C.S. nn. 153 ? 657.

DISTRIB. Endemic.

The gum-resin of this tree is not so penetratingly fragrant as that of the last species. With *B. Carterii*, Birdw. (in Trans. Linn. Soc. xxvii. (1871), 143), this species has probably its nearest affinity, but it also resembles some forms

of *B. serrata,* Roxb. (ex. Colebr. in Asiat. Res. ix. 379 cum tab.). It is at once distinguished, however, by its long inflorescences and large flowers.

3. Boswellia sp.

Socotra. On the hills south-west of Galonsir. B.C.S. n. 724.

Specimens in leaf of a Boswellia, which may be the juvenile form of one or other of the preceding, but it is impossible to decide. It differs somewhat from both of them.

4. B. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 505; Engl. in DC. Monog. Phanerog. iv. (1883), Addit. 537. Tab. XI.

Arborea cortice non papyraceo; foliis parvis multifoliolatis glabris rhachi alata, foliolis sessilibus oblongo-ellipticis obtusis sæpe emarginatis integris revolutis; paniculis paucifloris breviter pedunculatis foliis brevioribus, pedicellis brevibus floribus brevioribus; capsulis trigono-ovoideis sessilibus.

Arbor balsamiflua 30-pedalis cortice non papyraceo coriaceo. *Rami* terminales diametro uniformi subcrassi cum baseis foliorum delapsorum rugosi et cicatricosi. *Folia* ad apices ramorum conferta 4–4½ poll. longi impari-multifoliolati glabri, rhachi alata; foliola 23–27 opposita sed prope basin frequenter alternantia sessilia ¼–½ poll. longa ¼ poll. lata oblongo-elliptica v. elliptica v. fere obovata, terminali maximo et nonnunquam pinnatifido, obtusa sæpe emarginata subobliqua integra revoluta, juvenilia tridentata. *Paniculi* axillares inter folia dispositi pauciflori, pedunculo ½ poll. longo subtiliter puberulo; pedicelli breves crassi $\frac{1}{16}$–$\frac{1}{12}$ poll. longi. *Flores* expansi ⅙ poll. diam. *Alabastri* 5-goni. *Calyx* $\frac{1}{12}$ poll. longus 5-lobatus, lobis triangulari-apiculatis incrassatis obscure ciliatis. *Petala* 5–6 ⅛ poll. longa ovata carinata apice inflexa basi contracta subtiliter puberula. *Stamina* alterne minora, filamentis complanatis plusminusve subulato-acuminatis extus ad marginem disci inserta; antheræ staminum minorum filamentis æquilongæ v. longiores sparsim puberulæ. *Discus* undulatus intus dense puberulus. *Ovarium* sessile trigonum triloculare sursum in stylum crassum attenuatum glabrum, stigmate trilobato. *Capsula* sessilia trigono-ovoidea ⅕ poll. diam. trivalva marginibus carpellorum in juga prominentia productis.

Nom. Vern. Haliof.

Socotra. On the Haghier hills. Not uncommon. B.C.S. n. 466. Schweinf. n. 530.

Distrib. Endemic.

One of the Luban or frankincense trees of the island. It is a very distinct species, quite unlike any of the other species of the genus both in foliage and flowers. We only obtained specimens with flower-buds, but Schweinfurth sends splendid fruited and flowered specimens. The tree produces a considerable quantity of gum-resin, which they say is used as incense in the mosques. It is not much prized, however, and I should suppose not much, if at all, exported, if one may judge by the ready way the inhabitants gave it to us. But I have no precise knowledge as to its being exported. Schweinfurth says the bark of this is used as tanners' bark.

5. Boswellia sp.

Socotra. On the limestone plains. B.C.S. n. 708.

Of a small dwarf tree with hard spiny branches, bearing contracted laterals, on which the leaves are clustered, we have specimens. The leaves are unequally pinnate, about $\frac{5}{6}$ inch long, and there are some seven pairs of sessile leaflets. All the leaflets are tridentate, quite glabrous, and about $\frac{1}{24}$ inch long, and the rhachis is winged. The bark of the tree is dark-coloured, and on the contracted lateral branches the persistent insertions of the leaves give rise to a tuberculate surface, as in the plant I have just described. Can this be the young condition of the foregoing species *B. socotrana* ?

2. BALSAMODENDRON.

Balsamodendron, Kunth in Ann. Sc. Nat. sér 1, ii. (1824), 348 ; Benth. et Hook. Gen. Pl. i. 323.

I have retained Kunth's generic name, which has come into general use, although Baillon (Hist. d. Plantes v, (1874), 310), and after him Engler (Bot. Jahresb. i. (1881), 41), have adopted the name *Balsamea* of Gleditsch, for which they claim priority. But all evidence proves their assumption erroneous. Gleditsch published in 1782 (Schrift. d. Berl. Gesellsch. Naturf. Freunde 103, t. 8, f. 2) a paper entitled " Bemerkung über das Geschlecht und die Art der ächter Balsampflanze von Mecca," in which he describes, under the name *Balsamea meccanensis*, some dried specimens obtained by Achmet Effendi near Mecca. He contrasts the characters of this plant with those of *Amyris gileadensis*, Linn. (Mant. 65)—a species described by Linnæus on specimens sent from Arabia by Forskål—and specially points out how very different the two plants are, that indeed they could not belong to the same genus. The leaves of his plant he describes and figures as bipinnate, the calyx and corolla each of five parts, and larger than in the Linnean plant; the stamens ten, though they may be eight or nine, exceeding the corolla ; and the immature fruit with a basal pentagonal stipe. He also points out that Linnæus's plant is no *Amyris*. Now Engler, with whom I have corresponded on this matter, whilst admitting that the floral characters given by Gleditsch are not met with in any of the species of Balsamodendron he has examined, and concluding that " the flowers do not belong to the Burseraceæ at all," yet considers the branching and inflorescence agree well with what is observed in Balsamodendron, and the bipinnate leaves he regards as no barrier to such an identification. For my part I fail to recognise in Gleditsch's description and figure the characters of a Balsamodendron. Engler, too, himself shows his position to be untenable, for he identifies *Balsamea meccanensis*, Gled., as a type of which three Arabian plants, viz. :—*Balsamodendron opobalsamum*, Kunth (in Ann. Sc. Nat. sér. 1. ii. (1824), 348), *Balsamodendron gileadense*, Kunth (*loc. cit.*), and *Balsamodendron Ehrenbergianum*, Berg (in Bot. Zeit. (1862), 163), are merely forms. Now I

agree with him in regarding the three last-mentioned species as one and the same, but Berg expressly states that the species *B. gileadense* is founded on the *Amyris gileadense* of Linnæus, the very plant with which Gleditsch contrasts his. How then can the name *Balsamea* have any claim to adoption and to replace *Balsamodendron?* What plant Gleditsch described is a question that does not concern us here, and indeed it is difficult to tell, but certain is it that it is no *Balsamodendron.*

Engler has more right on his side when he claims priority for the generic name *Commiphora* of Jacquin. Undoubtedly the plant described and figured by Jacquin (Hort. Schœnb. ii. 66. (1797), t. 249) as *Commiphora madagascariensis* is a *Balsamodendron*, and Jacquin's name is much the older. But surely in the circumstances of this case considerations of convenience ought to outweigh the demands of arbitrary laws. The significant name *Balsamodendron* is now commonly accepted, not only by botanists but by pharmacists and physicians, and is indeed current in general literature, and the substitution of another name would be almost impossible, and would certainly lead to much confusion. How poor, too, is the name *Commiphora* beside the suggestive *Balsmodendron!* Had the alteration to *Balsamea* been legitimate, such objection would, for obvious reasons, have less force. Bentham and Hooker (*loc. cit.*), with set purpose, place Jacquin's name as a synonym of *Balsamodendron*, and their lead will be generally followed. Were *Commiphora* to be now accepted, it would entail the renaming of all the species, some thirty-six, and as they have been already renamed by Baillon and Engler under *Balsamea*, we should have an addition of some seventy specific names to the nomenclature. Surely this would be an excess of purist zeal and a perversion of means to an end.

As these pages are passing through the press, Engler's monograph of the Burseraceæ in the continuation of De Candolle's Prodromus has appeared. In it he has discarded *Balsamea* and adopted *Commiphora.* I cannot follow him in reviving Jacquin's generic name, but retain *Balsamodendron* as maintained by Bentham and Hooker, an example which I trust will be, in this country at least, generally followed.

A genus including some three dozen species, natives of tropical and south Africa, Arabia, and east India. In Socotra there are three endemic species, one distributed in south-west Asia, and possibly two others; but our material is not sufficient for identification of the latter.

1. **B. Mukul,** Hook. in Kew Journ. Bot. i. (1849), 259, t. 8; Boiss. Flor. Orient. ii. 3.

Commiphora Mukul, Engl. in DC. Monog. Phanerog. iv. (1883), 12.

Socotra. On Kadhab plain. B.C.S. n. 711.

Distrib. Arabia, Persia, and Scindh.

It is interesting to obtain in Socotra this, the plant which yields the gum-resin known as "Indian Bdellium," the "Googul" or "Mukul" of the Arabians and Persians. We only found it in one locality, and unfortunately did not obtain any of the gum-resin. The inhabitants collect this, but I did not learn of its being exported or used for any special purpose.

2. B. socotranum, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 505. Tab. XII.

Commiphora socotrana, Engl. in DC. Monog. Phanerog. iv. (1883), Addit. 536.

Arbuscula; foliis fasciculatis plerumque 1- (rarius 3-) foliolatis petiolatis, foliolis oblongis v. oblongo-ellipticis v. subobovatis obtusis undulatis v. rarius ad apicem vix dentatis pellucido-venulosis; inflorescentia sessili 1–3-flora; floribus sessilibus; staminibus 4 basi disci insertis, antheris ellipticis.

Arbor odora resinifera 30-pedalis inarmata sed in locis calcareis aridis sæpe fruticosa cum ramis rigidis spinosis, ramulis terminalibus pubescentibus striatis. *Folia* fasciculata ad apices ramorum contractorum v. suppressorum $\frac{3}{4}$–1 poll. longa 1-foliolata interdum 3-foliolata; foliola solitaria $\frac{1}{2}$–1 poll. longa $\frac{1}{4}$–$\frac{5}{6}$ poll. lata anguste oblonga v. oblongo-elliptica v. subobovata basi sæpe subcuneata in petiolum $\frac{1}{6}$–$\frac{5}{6}$ poll. longum attenuata, apice obtusa integra v. crenato-dentata margine sæpius obscure undulata, foliolo trifoliolatorum terminali maximo et apice sæpissime tridentato, omnia glabrescentia tenuia pellucido-venulosa. *Flores* ♂ sessiles precoces v. rarius inter folia evoluti dilute-carnei in cymas 1–3-floras sessiles aggregati. *Calyx* poculiformis 4-dentatus in alabastro dense villosus demum sparsim pilosus papillosus $\frac{1}{12}$ poll. longus. *Petala* $\frac{1}{6}$ poll. longa $\frac{1}{16}$ poll. lata acuta subcuspidata recurvata. *Stamina* 4 extus basi disci magni albi undulato-octagoni inserta; antheræ obtusæ oblongæ v. ellipticæ longitudine latitudinem excedente; staminodia o. Cæt. ignot.

NOM. VERN. Lögahan (B.C.S.). Leggehen (Schweinf.).

Socotra. Abundant. B.C.S. nn. 252, 256. Schweinf. nn. 458, 501, 514.

DISTRIB. Endemic.

One of the commonest of all the gum-resin producing trees in Socotra, and presenting somewhat varying features according to situation. In the favouring soil of the hill slopes of Haghier, a tree reaching as much as thirty feet high is formed, with branches ending in well-clothed twigs of considerable length. In such situations, too, the leaves are large, and whilst most commonly unifoliolate, are often found trifoliolate. On exposed sites on the dry limestone plains we have the opposite extreme,—small trees, or perhaps low shrubs, with short, hard, and rigid branches, often ending in spines and clothed with but few small leaves, rarely becoming trifoliolate. Unfortunately the plant was not in fruit when we were on the island, and Schweinfurth sends no fruit. The plant is very fragrant, but I did not learn that the gum-resin is collected in any quantity.

Specifically the Socotran plant finds its nearest affinity in *B. opobalsamum,* Kth. in Ann. Sc. Nat. sér 1, ii. (1824), 348, a plant widely spread in Arabia, and extending into Nubia and Somali Land, and perhaps also to Socotra.

The foliage of our plant, especially the shape of the leaflets, with their pellucid veins, easily distinguishes it. With *B. Myrrha,* Nees (Plant. Medic. ii. 1828, t. 357), a Somali Land plant, there are also resemblances.

A species sent by Hildebrandt from Somali Land, n. 1383, Schweinfurth suggests may be our plant. I doubt it. Dyer regards it as *B. opobalsamum,* Kth.

For remarks as to the gum-resin and the structure of the plant, see Appendix and Introductory Chapter.

3. B. parvifolium, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 506.

Commiphora parvifolia, Engl. in DC. Monog. Phanerog. iv. (1883), Addit. 536.

Arborea; foliis puberulis impari-pinnatis fasciculatis rhachi inter foliola subalata, foliolis sessilibus ellipticis obtusis integris; floribus sessilibus præcocibus; staminibus 4 ad marginem disci insertis, antheris oblongis.

Arbor parva odora resinifera 30-pedalis ramis ultimis subpuberulis nonnunquam spinescentibus. *Folia* puberula ad ramulos breves contractos fasciculata impari-pinnata opposite v. subopposite 3–7-foliolata $\frac{1}{3}$ poll. longa rhachi supra sulcata inter foliola dilatata v. subalata; foliola sessilia $\frac{1}{12}$ poll. longa elliptica late acuta v. obtusa plana venulosa sparsim puberula integra, terminali maximo obovato subpetiolulato et sæpe tridentato. *Flores* ♂ sessiles v. subsessiles precoces ad apicem ramulorum fasciculati in quoque fasciculo pauci (2–3). *Calyx* poculiformis $\frac{1}{12}$ poll. longus brevissime 4-dentatus in alabastro dense villosus proventu glaber. *Petala* $\frac{1}{8}$ poll. longa spathulata acuta recurvata. *Stamina* 4 ad marginem disci fusci parvi scutelliformis margine sinuati inserta; antheræ oblongæ longitudine latitudine duplolongiore. Cæt. ignot.

Socotra. On the plains. B.C.S. n. 656.

Distrib. Endemic.

Another gum-resin producing tree, with pinnate leaves, and quite distinct from all others in the genus by its small leaflets, which are almost glabrous, and its contracted branches, which are larger than is common.

Our specimens are very poor, and do not afford sufficient data for a very good description. We found the plant on the limestone plateaux west from Kadhab plain.

Its nearest ally is probably *B. pubescens,* Stocks (in Bomb. Trans. 1847, ex Hook in Kew Journ. Bot. i. (1849), 264, t. ix.; A. Benn. in Hook. Flor. Brit. Ind. i. 529); a Scindh plant.

4. B. planifrons, Schweinf. in Proc. Roy. Soc. Edin. xi. (1882), 506. Tab. XIII.

Commiphora planifrons. Engl. in DC. Monog. Phanerog. iv. (1883), Addit. 536.

Arbuscula inermis, ramis densis horizontaliter expansis juvenilibus dense tomentosis; foliis breviter petiolatis imbricato-pinnatis ad apices ramorum lateralium brevium confertis

foliolis 5–10-jugis subæqualibus ellipticis v. ovatis obtusis late revolutis bullosis; floribus præcocibus solitariis v. binis sessilibus minutis; staminibus 4 disci margini 4-lobati insidentibus, antheris oblongo-cordatis; fructu oblongo-acuto glaberrimo apiculato.

Arbuscula 3-pedalis ramis succosis aromaticis densis horizontaliter expansis, inermis ad folia et partes novellas dense tomentosa. *Ramuli* brevissimi ad apices fasciculato-foliati. *Folia* petiolata ½–¾ poll. longa 5–7 imbricato-pinnata sicca griseo-tomentosa dum viva læte viridia, petiolo lamina quadruplobreviore; foliola subæqualia ovata subsessilia late revoluta bullosa. *Flores* ante folia ad ramulorum apices orti singuli v. bini hermaphroditi (an semper?) sessiles. *Calyx* glaberrimus ad medium 4–5-lobus, lobis triangularibus. *Petala* 4 calyce duplolongiora obovata acuta acumine inflexo, carnea albo-marginata subplicata. *Stamina* 4 petalis tertia parte breviora, disci margine 4-lobati insidentia; antheræ oblongo-cordatæ obtusæ. *Stigma* profunde 4-lobatum. *Drupa* glaberrima oblongo-acuta apiculata, epicarpio bivalvi, mesocarpio tenuissimo, putaminibus 2 uno abortivo.

Socotra. Near Tamarida, and above Kischen at 2400 feet altitude. B.C.S. n. 709. Schweinf. n. 671. Hunter n. 3.

Distrib. Endemic.

A curious species, of which Schweinfurth remarks—"folia illis *Boswelliæ neglectæ* similia sed pinnæ æquales et revolutæ. Flores *B. opobalsami* magnitudine sed petalis et staminibus brevioribus. Fructifer 1 Mayo 1881. Drupa omnino cum *B. opobalsamo* congruit nisi valvis tantum ternis sed mesocarpio ut in illo tenuissimo."

We only obtained small twigs of this species with no flower or fruit, and our specimens, as well as Hunter's, show leaves very much smaller, much less hairy, and more revolute than in Schweinfurth's plant. Schweinfurth's specimens have both flowers and fruit, and he has kindly supplied the description.

5. Balsamodendron sp.?

Socotra. B.C.S. n. 418.

We have leafy specimens of another gum-resin producing tree. In respect of general habit and form of leaf it resembles *B. parvifolium*, but the bark is not dark in colour but a bright grey. Our specimens do not enable us to determine its identity, and we only record its existence. It is probably a *Balsamodendron*, and very near *B. parvifolium*.

6. Balsamodendron sp.?

Socotra. B.C.S. n. 154.

Two fragmentary specimens, hardly to be referred to any of the preceding, are in our collection. One may be of *B. opobalsamum*, Kth. One specimen is an oldish stem with ternate leaves, the leaflets somewhat dentate. The other is a young twig with pinnate (2 pairs of pinnæ) leaves, having an odd leaflet and ternate or even trifid segments.

Order XXII. RHAMNEÆ.

A considerable order of the warm and temperate regions of both old and new worlds.

ZIZYPHUS.

Zizyphus, Juss. Gen. 380; Benth. et Hook. Gen. Pl. i. 375.

A considerable genus of tropical and subtropical trees and shrubs, most abundant in Asia and America. Two species occur in Socotra; one is a common old world tropical form, the other is limited in its distribution to the western parts of Asia and tropical Africa.

1. Z. Jujuba, Lamk. Dict. iii. 318; DC. Prod. ii. 21; Hemsl. in Oliv. Flor. Trop. Afr. i. 379; Boiss. Flor. Orient. ii. 13; Laws. in Hook. Flor. Brit. Ind. i. 632; Wight Ic. t. 99.

NOM. VERN. Nebek (Wellst.).

Socotra. Common. B.C.S. n. 289.

DISTRIB. Old world tropics.

2. Z. Spina-Christi, Willd. Sp. i. 1105; DC. Prod. ii. 20; Hemsl. in Oliv. Flor. Trop. Afr. i. 380; Boiss. Flor. Orient. ii. 13.

Rhamnus Nabeca, Forsk. Fl. Ægypt. Arab. 204.

NOM. VERN. Nebek (Wellst.).

Socotra. Not uncommon. B.C.S. 661.

DISTRIB. Tropical Africa and western Asia.

There can be little doubt that this and the foregoing species are the trees spoken of by Wellsted (in Journ. Roy. Geogr. Soc. v. (1835), 151), as Nebek trees. He thus writes: "This tree is well known to botanists as the *lotus nebea*—its height is usually from 20 to 30 feet—the bark is light-coloured, rough, and crossed longitudinally by numerous fissures; the leaves are cordiform (or heart-shaped) and small, the branches are large, but the foliage is somewhat scanty. Notwithstanding the hardness and length of the spines which grow on its branches, intermingled with its leaves, the camels, from the cartilaginous formation of their mouths, feed on both with much avidity, and without to appearance suffering any inconvenience. The fruit, of which they are equally fond, clusters in great abundance amidst its branches, and from its golden colour gives to the tree a rich and pleasing appearance; the natives assert that it is produced at all seasons; it resembles a cherry in form and size, and has a peculiar though mild and pleasant flavour. The Arabs pound them between two stones into a paste-like consistence, which they mix with ghee, and swallow with much apparent relish."

Order XXIII. AMPELIDEÆ.

A small order of plants, frequently climbers, widely spread over the warmer regions of the globe, but most abundant in the old world.

VITIS.

Vitis, Linn. Gen. n. 284; Benth. et Hook. Gen. Pl. i. 387.

A genus which constitutes nearly the whole order, and has its distribution. It is represented in Socotra by three species, two of which are endemic, and the third is a tropical African and Asiatic species.

1. V. quadrangularis, Wall. Cat. 5992; Baker in Oliv. Flor. Trop. Afr. i. 399; Laws. in Hook. Flor. Brit. Ind. i. 645; Wight Ic. t. 51.

Socotra. On the plateau south-west from Galonsir at an altitude over 1500 feet. B.C.S. n. 304.

Distrib. Through tropical Africa, Johannas, Ceylon, and India, to Malacca.

The plant on Socotra is almost leafless, only on the terminal shoots do we find leaves, and these are in our specimens rather more attenuated at the base of the lamina than is usual in the type. I have, however, but little hesitation in referring our plant to this species.

It grows in small clumps covering the wide plateaux at the western end of the island.

2. V. subaphylla, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 506.

Dumetosa ramulis complanatis ad nodos contractis non alatis carnosis; foliis paucis integris subspathulatis v. oblanceolatis in petiolum attenuatis glabris; cymis brevibus umbellatim ramosis; pedicellis tenuibus; floribus tetrameris; fructu conico viridi.

Suffrutex caulibus ramisque dense intertextis dumetumque formantibus. *Caules* paullo conferti ad nodos contracti internodiis $2\frac{1}{2}$ poll. longis glabris sed cuticulo squamoso-rumpente carnosis. *Ramuli* juveniles multocompressi sicci valde striati. *Folia* pauca ad ramulos juveniles solum obsidentia mox decidua simplicia petiolata $\frac{1}{2}$ poll. longa $\frac{1}{8}$ poll. lata subspathulata v. anguste oblanceolata et in petiolum attenuata subacuta integra glabra carnosula. *Cirrhi* oppositifolii versus basin articulati et ad nodum squama amplexicauli suffulti. *Flores* in cymas laterales umbellatim ramosas $2\frac{1}{2}$ poll. diam. glabras dispositi; pedicelli tenues $\frac{2}{3}$ poll. longi. *Calyx* cyathiformis 4-dentatus. *Petala* 4. *Stylus* subulatus. *Fructus* conicus $\frac{1}{3}$ poll. longus glaber viridis longe pedicellatus.

Nom. Vern. Atarha (B.C.S.). Atherhaa (Schweinf.).

Socotra. Very common on the plain near Galonsir. B.C.S. n. 81. Schweinf. n. 244.

Distrib. Endemic.

This is quite a distinct species in the simple entire-leaved group of vines. Like *V. quadrangularis*, as found in Socotra, it is nearly leafless, only the

younger twigs showing leaves, and these soon fall off. It is one of the commonest plants on the limestone plain about Galonsir, forming small clumps with intertwined branches.

3. V. paniculata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 507.

Scandens caulibus anguste alatis, juvenilibus quadrangulatis carnosis; foliis magnis breviter palmatim 3–5-lobatis basi cordatis late crenatis glabris; cymis subumbellatim paniculatis; pedicellis tenuibus; floribus tetrameris; fructu conico nigrescente.

Scandens et late patens. *Caules* altiores subteretes cum alis quatuor angustis, juveniles quadrangulares, carnosi ad nodos contracti, internodiis 4 poll. longis cystolitheis dense papillosis et siccis corrugatis. *Folia* magna fere pedalia, lamina ½-ped. diam breviter palmatim 3–5-lobata basi cordata v. subhastata margine late crenata cum mucrone parvo in intervallis ad apices venorum carnosa; petiolus glaber lamina brevior. *Cirrhi* oppositifolii lignosi articulati apice cochleariformes. *Flores* in cymas subumbellatim paniculatas patentes $\frac{5}{6}$ poll. diam. glabras dispositi; pedicelli tenues $\frac{1}{6}$ poll. longi. *Calyx* 4-dentatus. *Petala* 4 alte cucullata. *Stamina* 4. *Stylus* crassus. *Fructus* ¼ poll. longus conicus glaber nigrescens longe pedicellatus.

Nom. Vern. Atarha (B.C.S.). Atherhaa (Schweinf.).

Socotra. Common, climbing amongst small trees on the hill slopes. B.C.S. n. 413. Schweinf. n. 510.

Distrib. Endemic.

A distinct species, having a distant affinity with *V. quadrangularis*, Wall., although its nearest ally is probably the imperfectly known *V.* (*Cissus*) *tetragona*, Harvey (in Harv. and Sond. Flor. Cap. i. 249), a plant of Natal. Of that species, founded by Harvey upon specimens grown by Mr Wilson Saunders from plants sent home by Plant, I have seen the type in Kew Herbarium, consisting of two internodes with three leaves; and although they much resemble some of the Socotran specimens, they are hardly conspecific. It may, however, turn out that Harvey's plant is the same as one collected by Schweinfurth in central Africa (nn. 274, 401), and sent out as *Cissus quadrangularis*, Wall.—a species which it certainly is not, differing very markedly from the Indian types, and also from the other African forms of that species by its longer and more freely branching inflorescence and longer pedicelled flowers, as well as in the general form of the leaf. These are characters in which it approaches somewhat our Socotran plant here described, with which it has altogether many points of resemblance.

A plant abundant all over the wooded slopes of the hills.

Order XXIV. SAPINDACEÆ.

A very large family, abundantly spread within the tropics, more rare in temperate regions. Two genera are found in Socotra; one cosmopolitan in the tropics, but with its greatest development in America, the other chiefly Australian, but with a few representatives in other regions.

1. ALLOPHYLUS.

Allophylus, Linn. Gen. n. 476.
Schmidelia, Linn. Mant. 67 ; Benth. et Hook. Gen. Pl. i. 396.

A large genus of trees or shrubby plants, chiefly inhabiting America, but represented all through the tropics of the old world.

1. **A.** (Schmidelia) **rhoidiphyllus**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 507.

Arboreus plusminusve pubescens ; foliis trifoliolatis, foliolis obovatis v. oblongo-obovatis v. oblongo-ellipticis obtusis v. emarginatis basi cuneatis revolutis sinuato-crenatis subtus petiolisque pubescentibus ; racemis densis foliis subæquilongis ; pedicellis floribus vix longioribus ; petalis staminibusque declinatis.

Arbor parva caulibus glauco-griseis. *Ramuli* pubescentes lenticellis punctati sæpe rugosi et conferti. *Folia* petiolata trifoliolata magnitudine variantia $\frac{1}{4}$–2 poll. longa $\frac{2}{3}$–1 poll. lata (petiolo $\frac{5}{12}$–$\frac{7}{12}$ poll. longo) sed in exemplis maximis interdum $5\frac{1}{2}$ poll. longa 2 poll. lata petioloque $2\frac{1}{2}$ poll. longo ; foliola obovata v. oblongo-obovata v. elliptico-oblonga obtusa v. late acuta v. emarginata basi cuneata integraque apice sinuato-lobata revoluta subtus pubescentia nervisque prominulis ad axillas villosis, supra subglabra nitidaque v. subpubescentia et saturate viridia, terminali foliolo maximo sessili v. petiolulato petiolulo pubescente. *Flores* breviter pedicellati in fasciculos 2–4-floros ad rhachim pubescentem $1\frac{1}{4}$–2 poll. longam foliis subæquilongam solitariam axillarem dense aggregati ; pedicelli $\frac{1}{24}$ poll. longi calyce vix longiores. *Sepala* 4 scaphoidea imbricata. *Petala* 4 irregularia, limbo transverse oblongo subtrilobato squamifero. *Stamina* in fl. ♂ exserta, in fl. ♀ inclusa. *Ovarium* 2–3-lobatum 2–3-loculare compressum pilis adpressis vestitum. *Stylus* 2–3-fidus lobis subulatis. *Drupæ* plerumque solitariæ globosæ v. subpyriformes $\frac{1}{4}$ poll. diam. aureæ.

Nom. Vern. Zirkin (B.C.S.). Sirki (Schweinf.).

Socotra. Very common. B.C.S. nn. 160,? 247, 248, 348, 421. Schweinf. nn. 413, 474.

Distrib. East Africa.

Under this name I group a number of specimens brought from different localities on the island, which I consider to be merely states of one very common and variable species. We have not perfect specimens with foliage-leaves, flowers, and fruit of all of them, indeed we only obtained flower-buds on one form, the others were collected in fruit. Schweinfurth, however, sends beautiful flowering specimens of two of the forms, which have enabled us to determine the genus and to give a diagnosis. The foliage is so thoroughly that of *Rhus*, that without an examination of flowers, one would certainly refer this plant to that genus. The variation in the leaves is very great, not so much in form as in size and clothing. In some specimens the leaves are fully five and a half inches long by two inches broad, whilst in the smaller leaved states they may be but a half-inch long. The plant is sometimes altogether pubescent, in other specimens we find an almost glabrous condition.

In the present most unsatisfactory state of the genus I have not been able to refer this plant to any described species, but in Kew Herbarium there are specimens collected by Hildebrandt, and labelled—"n. 2321, Ixamtei in Duruma. Auf Kikamba: Mussakaongo,"—provisionally referred to the vicinity of *A.* (Schmidelia) *repanda*, Baker, which belong to the small leaved form of this Socotran plant. Our plant is then not endemic. I have seen no large leaved forms from Africa or other locality.

With three African species our plant is related:—*A.* (Schmidelia) *rubifolia*, Hochst. (in Ach. Rich. Tent. Flor. Abyss. i. 103; Baker in Oliv. Flor. Trop. Afr. i. 423), *A.* (Schmidelia) *alnifolia*, Baker, and *A.* (Schmidelia) *repanda*, Baker (*loc. cit.*)—all species of somewhat indefinite limitation, and at present including forms which may eventually prove to be distinct species. But the Socotran plant in any of its states is easily diagnosed. From *A. rubifolia* its shorter racemes and pedicels, its leaves not inciso-repand, and its more globular fruits distinguish it. In the other two species mentioned, petals are wanting, and they are glabrous with larger inflorescences. *A. alnifolia* resembles it most in the form of leaf.

2. Allophylus, sp. ?

Socotra. On the hill slopes near Tamarida. B.C.S. n. 685.

Specimens of a plant with coriaceous trifoliate foliage leaves, but without flowers or fruit, are possibly referable to this genus, and in it to the vicinity of *A.* (Schmidelia) *decipiens*, Arn. (in Hook. Lond. Journ. iii. 153), a Cape species. It is, however, impossible to decide upon our imperfect material.

2. DODONÆA.

Dodonæa, Linn. Gen. ed. I. n. 855; Benth. et Hook. Gen. Pl. i. 410.

An almost exclusively Australian genus, but with a few scattered representatives in the tropics of the globe, and one cosmopolitan tropical species which occurs in Socotra.

D. viscosa, Linn. Mant. 228; Boiss. Flor. Orient. i. 953; Baker in Oliv. Flor. Trop. Afr. i. 433; Hiern in Hook. Flor. Brit. Ind. i. 697; Franch. Sert. Somal. in Miss. Révoil 20.

D. Burmanniana, DC. Prod. i. 616; Wight Illustr. i. t. 52.

Socotra. On Haghier hills. B.C.S. n. 659.

Distrib. Cosmopolitan in tropics.

Order XXV. ANACARDIACEÆ.

A large family inhabiting tropical and warm countries. Two genera are represented in Socotra, one of which is dispersed over the whole globe, the other being confined to Africa and Asia.

RHUS.

Rhus, Linn. Gen. n. 369; Benth. et Hook. Gen. Pl. i. 418.

A large genus of the warmer extra-tropical regions, many species occurring at the Cape, and but few in the tropics. One Socotran species is endemic, but with a near Birmese alliance; the other is a tropical and south African one.

1. **R. glaucescens**, Ach. Rich. Tent. Flor. Abyss. i. 143; Oliv. Flor. Trop. Afr. i. 437.

Socotra. On the hill slopes. B.C.S. n. 686.

DISTRIB. Tropical Africa and Natal.

We have specimens of a plant, with foliage-leaves only, which appears to be this somewhat variable species. But in this genus identification by foliage is not easy, and the Socotran plant might be some other species, or may, indeed, fall into a Sapindaceous genus.

2. **R. thyrsiflora**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 507.

Arborea glabra; foliis trifoliolatis v. unifoliolatis, foliolis oblongis v. oblongo-ellipticis v. oblongo-obovatis obtusis integris v. obscure sinuato-lobatis perspicue reticulatis; inflorescentia thyrsoidea; pedicellis subtilibus floribus longioribus; sepalis petalis multo brevioribus; disco plano obscure crenato.

Arbor parva 20-pedalis omnino glabra paniculis subtiliter puberulis exceptis. *Folia* palmatim trifoliolata v. unifoliolata; foliola coriacea sæpe 4½ poll. longa 1¾–2¼ poll. lata sed prope extremitates ramulorum minora, oblonga v. oblongo-elliptica, terminali maximo frequenter oblongo-obovato sessili v. petiolato, obtusa integra v. obscure sinuato-lobata basi attenuata nervis plurimis patentibus parallelibus ultime in reticulum perspicuum anastomosantibus; petiolus ¾–2¼ poll. longus. *Paniculi* terminales axillaresque thyrsoidei ramosissimi sæpe 9 poll. longi late patentes folia longe superantes; pedicelli subtiles floribus triplolongiores. *Flores* minuti. *Sepala* subrotundata interdum subtridentata persistentia sub fructu recurvata. *Petala* ¾ poll. longa ovata subacuta v. obtusa sepalis triplolongiora. *Discus* planus obsolete 10-crenatus. *Drupæ* globosæ ⅙ poll. diam.

NOM. VERN. Zöref (B.C.S.). Surif (Schweinf.).

Socotra. Common on the hill slopes and in the valleys. B.C.S. n. 369. Schweinf. nn. 480, 736. Nimmo.

DISTRIB. Endemic.

This species, which is one of the commonest small trees on Socotra, is, on account of its affinity with a species from northern Birma, of considerable interest. So close indeed is its relationship to *R. paniculata*, Wall. (Cat. n. 993; Hook fil. Flor. Brit. Ind. ii. 10), from Birma and Yunan, that it is not without some difficulty diagnostic marks are obtained, and these are of such a nature as might in plants of a different geographical distribution be considered hardly sufficient to forbid them being regarded as conspecific. The only absolute character wherein the species are separated is the form of the disk. In the Birmese species it is distinctly cup-shaped with a crenately lobed margin, in the Socotran

plant it is flat with an obscurely crenate edge. There are other minor points in which differences obtain; thus, the leaves of the Socotran plant are often unifoliolate, the leaflet being petioled, when they are trifoliolate the odd leaflet is, as a rule, sessile or nearly so, though in some specimens it becomes distinctly petiolate, and all the leaflets are rounded and obtuse at the apex. Now in *R. paniculata* the leaves appear to be always trifoliolate, with a petioled odd leaflet, and they are generally broadly acute. Again, *R. thyrsiflora* has long, much branched, spreading inflorescences, with slender terminal pedicels, which are always longer than the flower and the fruit. In the Birmese plant, on the other hand, the panicle is not so greatly branched, and the flowers are somewhat crowded on shorter pedicels at the ends of the branches, the pedicels being shorter or about the same length as the fruit.

It is such a far cry to northern Birma from Socotra, that it is hard to believe that the plants in the two regions are conspecific. Possibly future investigation of the mainland adjacent to Socotra may lead to the discovery of connecting links, which will enable us to unite the two.

A plant from Nimmo, with the customary label "Red Sea," is in Kew Herbarium, and is referred to by Oliver (Flor. Trop. Afr. i. 438) under and as allied to *R. glaucescens*, Ach. Rich., but there is no question as to its being the Socotran species.

ODINA.

Odina, Roxb. Fl. Ind. ii. 293; Benth. et Hook. Gen. Pl. i. 423.

A genus of some fifteen species of trees, often producing gum-resin, a few being natives of India, the others inhabiting tropical and subtropical Africa. Both Socotran species are endemic.

1. O. ornifolia, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 507.

Arborea ramis pubescenti-velutinis; foliis magnis 5–7-foliolatis, foliolis ovatis obliquis subcuspidatis sessilibus v. subsessilibus velutinis; racemis vix ramosis axillaribus sub fructu foliis æquilongis, pedicellis brevibus; calyce 4-partito persistente; fructu globoso velutino-pubescente.

Arbor 50-pedalis cortice exfoliante. *Rami* ad extremitates rugosi, juveniles pilis simplicibus fusco-velutini. *Folia* 8–9 poll. longa velutina 5–7-foliata; foliola 2–2¾ poll. longa 1½–1¾ poll. lata sessilia v. subsessilia ovata v. oblongo-ovata basi rotundata v. subcordata apice subcuspidata v. abrupte subacuminata margine integra subrevoluta, foliolo terminali sæpe oblongo v. obovato basi cuneato. *Racemi* fructiferi axillares solitarii 8–9 poll. longi subrecurvi fusco-velutini ramulis lateralibus brevibus 1–3-floris; pedicelli fructus vix $\frac{1}{16}$ poll. longi crassi. *Calyx* sub fructu persistens 4-lobatus, lobis ovato-acutis pubescentibus. *Fructus* globosus ⅓–½ poll. longus pubescens aurantiacus, stylis non persistentibus.

Nom. Vern. Uksha (B.C.S.). Eksche (Schweinf.). Ukshare (Wellst.).

Socotra. A not uncommon tree. B.C.S. n. 276. Schweinf. n. 504.

We have no flowers of this plant, but it is quite a distinct species, finding its nearest allies in *Lannea* (now *Odina*) *velutina*, Guill. et Perr. (Flor. Seneg. i. 154, t. 42), and *O. Barteri*, Oliv. (Flor. Trop. Afr. i. 446), from Upper Guinea. From some forms of the Indian *O. Wodier*, Roxb. (Flor. Ind. ii. 293), it is not far removed. Oliver (*loc. cit.*) mentions a plant, *O. fraxinifolia*, Fenzl., and in Schweinfurth's catalogue of Æthiopian plants the same name occurs for a Nubian plant; but apparently no description has been published. The name would lead one to expect it must have some resemblance with our species.

Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 199), thus writes of this tree :— "One of the largest trees on the island is the Ukshare, which produces a species of wild grape, bearing however but little resemblance to that fruit, unless in its clustering form and rounded shape. The distribution of the branches of this and all the other large trees (excepting the eshaib) is fantastic, tortuous, and knotty."

2. **O. asplenifolia**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 508.

Arborea ramis glabris interdum spinosis; foliis parvis 13–21-foliolatis ad apices ramulorum lateralium abbreviatorum confertis rhachi alata; foliolis subrhomboideis v. obcuneatis v. subobovatis apice dentatis v. subintegris sessilibus v. subsessilibus sursum sensim minoribus glabris glaucis; racemis tenuibus axillaribus.

Arbor parva balsamiflua cortice albo-griseo. *Rami* glabri, juveniles brunnei sæpe spinosi v. ab extremitate deorsum marcescentes, laterales sæpe contracti v. subsuppressi. *Folia* asplenioidea ad ramos juveniles alterne dispersa sed ad apices lateralium ramorum abbreviatorum conferta, sessilia v. subsessilia $1\frac{1}{2}$–$1\frac{3}{4}$ poll. longa rhachi anguste alata, 13–21-foliolata glabra; foliola opposita sed sæpe versus basin rhacheos alterna, versus apicem gradatim minora $\frac{1}{5}$ poll. longa v. minora rarissime $\frac{1}{4}$ poll. longa $\frac{1}{8}$ poll. lata subrhomboidea v. obcuneata v. subobovata apice 3–5-dentata v. subintegra, a medio deorsum integra cuneataque, foliolo terminali sæpissime maximo plerumque pinnatifido acuto v. obtuso, venulis primariis prominulis albidisque in pagina glauco-viridi. *Racemi* axillares tenues subpubescentes; bracteolæ amplexicaules pubescentes. *Alabastri* globosi. *Flores* tetrameri. Cæt. ignot.

Socotra. On the hill slopes, often at a high elevation. B.C.S. n. 710.

Distrib. Endemic.

A small tree, of which we have incomplete specimens, fully developed flowers and fruits being unknown. From the young inflorescence, however, I have been able to determine the genus, and there is no doubt that it is a new species.

It is a very graceful tree, with small asplenium-like leaves. It yields a gum-resin. I obtained, however, no definite information regarding the collection of, or the special attributes of this, except that it is a bad Luban. In this respect the tree is homotonous with the *O. obovata*, Hook. fil. (Oliv. Flor. Trop. Afr. i. 447), from Somali Land, which is said to yield a poor Luban not collected by the Somalis. In that species our Socotran plant finds the nearest affinity,

but the obovate larger leaves with fewer leaflets, and the sparse stellate tomentum, are quite diagnostic.

I am not certain from our specimens that the leaves are always so small as I have described. One leaf attached to the older wood of a branch bearing a young twig shows leaflets much larger and fewer than those ordinarily occurring. The tree from which we took our specimens was not an immature one, as it had young inflorescences, so that the smaller leaves are not a juvenile form.

Order XXVI. LEGUMINOSÆ.

This vast natural family, the second largest of flowering plants, is represented in Socotra by twenty-six genera, and of no other family excepting Gramineæ have we so many genera from the island. Of the genera, nineteen have a less or greater range over the tropical regions of the world, some extending to subtropical and temperate regions, some of them spread by cultivation; three are old world genera of some range, one is peculiarly a south-west Asiatic genus, two are peculiarly genera of the Indian peninsula, one of them occurring also in Mauritius, and one is endemic.

1. CROTALARIA.

Crotalaria, Linn. Gen. n. 862; Benth. et Hook. Gen. Pl. i. 479.

A large genus, spread in the warmer regions of both old and new worlds, attaining a maximun in tropical Africa. There are five species in Socotra, three of which are endemic, a fourth is a tropical African form, and the fifth is a native of the East Indies now widely spread in Africa and America.

1. C. spinosa, Hochst. in herb. Schimp. Abyss. sect. i. n. 150; Baker in Oliv. Flor. Trop. Afr. ii. 17.

Socotra. A plant of the sandy plains. B.C.S. n. 501. Schweinf. in lit.

Distrib. Tropical Africa.

2. C. retusa, Linn. Sp. 1004; DC. Prod. ii. 125; Baker in Oliv. Flor. Trop. Afr. ii. 13, and in Hook. Flor. Brit. Ind. ii. 75; Bot. Mag. t. 2561.

Socotra. Not uncommon on the plains near Galonsir. B.C.S. n. 662. Schweinf. n. 680.

Distrib. A common East Indian species. Introduced in Africa and America.

3. C. strigulosa, Balf. fil. in Proc. Roy Soc. Edin. xi. (1882), 508.

Omnino strigulosa ramis elongatis tenuibus prostratis; foliis unifoliolatis angustis linearibus v. latis et ellipticis v. oblongo-ellipticis subsessilibus; racemis terminalibus elongatis pedicellis brevibus; calycis lobis tubo longioribus; corolla exserta; legumine oblongo breviter exserto pubescente 6-spermo.

Herba perennis ramulis juvenilibus dense senioribus sparsim pilis albis adpressis vestitis ½–2-pedalibus prostratis tenuibus. *Folia* unifoliolata sessilia v. subsessilia plerumque subobliqua sæpe angusta linearia, v. oblongo-linearia late acuta ¾–1 poll. longa ⅙–⅓ poll. lata sed ad formas ellipticas v. oblongas v. oblongo-ellipticas obtusas v. subacutas variantia strigulosa. *Stipulæ* perspicuæ setiformes mox deciduæ. *Racemi* sæpe 8 poll. longi 4–8-flori terminales et foliis oppositi; bracteolæ minutæ; pedicelli ⅛ poll. longi bracteolis triplolongiores ultime deflexi. *Calyx* ¼ poll. longus alte 5-fidus, laciniis subæqualibus v. superioribus latioribus acuminatis tubum multo excedentibus extus piloso-strigulosis. *Corolla* crocea calycem parum superans; vexillum ⅓ poll. longum rotundatum rutilo-venosum; carina rostrata antice breviter villosa. *Legumen* oblongum $\frac{5}{12}$ poll. longum ¼ poll. latum dense pubescens longe exsertum. *Semina* sex.

Socotrâ. Common on the sandy plains. B.C.S. nn. 72, 663. Schweinf. nn. 656, 721.

Like so many of the Socotran plants, this species shows considerable variation in the leaves, both as to size and to form. Schweinfurth sends a specimen (n. 656) from Wadi Kischen, which I take to be merely a form of our plant, but it has pubescent almost hirsute stems and leaves, and these latter are larger than is usual and entirely elliptic. The floral pedicels in this form are stouter and the fruit longer, attaining fully half an inch. I do not, however, see how it can be separated from the type.

The closest affinity of the Socotran plant is probably with *C. triquetra*, Dalzell (in Hook Kew Journ. ii. (1850), 34; Baker in Hook. Flor. Brit. Ind. ii. 71), a plant of the Deccan peninsula and Ceylon; but it is a glabrescent plant, and the pods are 15–16-seeded. With *C. prostrata*, Roxb. (Hort. Beng. 54; Baker, *loc. cit.* 67), from the same localities, there is also a resemblance, and especially through Schweinfurth's form (n. 656); but the glabrous pods, 12–15-seeded, and the absence of stipules separate the Indian plant. *C. evolvuloides*, Wight (in Wall. Cat. 5410; Baker, *loc. cit.* 68), of like distribution with these mentioned, may be regarded as an ally, but is altogether a more hairy plant.

4. C. leptocarpa, Balf. fil. Tab. XIV, A.

C. dubia, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 508.

Omnino strigulosa ramis tenuibus late patentibus; foliis petiolatis palmatim trifoliolatis, foliolis sessilibus lineari-lanceolatis et ad formas obovatas variantibus; racemis elongatis oppositifoliis paucifloris; pedicellis capillaribus brevibus; calycis lobis tubo quadruplo-longioribus; corolla longe exserta; legumine oblongo submembranaceo venuloso pubescente 12-spermo.

Herba humilis caule lignoso parvo subterraneo. *Rami* subfiliformes copiosi internodiis longis late patentes sæpe 1½-pedales decumbentes strigulosi v. substrigosi. *Folia* palmatim trifoliolata petiolata (petiolo ¼–½ poll. longo) basi villosa; foliola (terminali longissimo) sæpius lineari-lanceolata acuminata et ½–1⅓ poll. longa sed per intermedias ad formas obovatas mucronatas ⅓ poll. longas ⅛ poll. latas variantia, omnia sessilia v. subsessilia strigosa. *Stipulæ* minutæ subulatæ. *Racemi* elongati cum internodiis ¾–1 poll. longis terminales et oppositifolii pauciflori; bracteolæ minutissimæ; pedicelli capillares ⅙ poll. longi. *Calyx* ⅕ poll. longus extus pilis adpressis brevibus sparsim vestitus, laciniis angustis

acuminatis $\frac{1}{6}$ poll. longis, superiore latiore. *Corolla* flava longe exserta; vexillum suborbiculare mucronatum $\frac{3}{10}$ poll. longum; carina margine inferiore ciliata. *Staminum* filamenta alterne sursum dilatata in tubum supra fissum connata. *Ovarium* stipitatum; stylus incurvus $\frac{1}{8}$ poll. longus superne circumcirca barbatus dilatatus complanatus, stigmate bilobo extus obliquo lobis complanatis. *Legumen* (an maturum?) $\frac{7}{12}$ poll. longum $\frac{1}{5}$ poll. latum breviter stipitatum oblique oblongum compressum membranaceum venulosum pubescens. *Semina* 12.

Socotra. Common on the plains. B.C.S. n. 149. Schweinf. n. 722.

Distrib. Aden.

I originally published this species under the name *C. dubia*. This name, I find, has been already given to an Indian plant (Grah. in Wall. Cat. 5404; Baker in Hook. Flor. Brit. Ind. ii. 73), and I have therefore here renamed the Socotran plant.

This plant, which in its general habit and structure is thoroughly Crotalarioid, resembling much the species last described—*C. strigulosa*—and like it having leaves of diverse forms, differs so decidedly from the type of the genus that it is with difficulty one can include it as a species. The fruit is not at all inflated or tumid, and the valves are quite thin and membranous with beautiful veining. In addition, there is a divergent character in the stigma, which is distinctly two-lobed, each lobe being flattened and pointed. But if we exclude the plant from this genus, I can find no other in which to place it, and the characters are perhaps hardly sufficient to warrant at present the creation of a new genus.

Schweinfurth, when at Aden recently, discovered the plant there, and has sent home specimens, now in Kew Herbarium (Schweinf. Exp. Rieb. n. 44). He says it grows abundantly "behind Ma'alla." I find the Aden plant does not show distinctly the lobing of the stigma visible in the Socotran flowers.

5. **C. pteropoda**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 508. Tab. XIV, B.

Procumbens sericeo-canescens; foliis petiolatis alterne digitatim trifoliolatis, foliolis ellipticis v. obovatis obtusis; floribus solitariis oppositifoliis; pedicellis tetraquetris crebris; calyce bilabiato corolla longiore; legumine tumido pubescente polyspermo.

Herba parva ramis procumbentibus sericeo-canescentibus. *Folia* $3\frac{1}{4}$ poll. longa petiolata (petiolo sericeo-canescente $\frac{1}{4}$ poll. longo) digitatim alterne trifoliolata; foliola $\frac{5}{12}$ poll. longa $\frac{1}{4}$ poll. lata (terminali maximo) subsessilia elliptica v. obovata obtusa sæpe mucronulata argenteo-sericea subtus pallidiora. *Stipulæ* obsoletæ. *Flores* solitarii oppositifolii; pedicelli crebri tetraquetri v. 4-alati $\frac{1}{3}$ poll. longi canescentes. *Calyx* $\frac{1}{2}$ poll. longus corolla longior bilabiatus extus argenteo-sericeus, labio superiore arcte bifido lobis oblongo-ellipticis divergentibus, inferiore trifido lobis angustioribus. *Corolla* purpurea; vexillum obovatum acutum brevissime unguiculatum supra unguem 2-callosum; alæ obovatæ obtusæ vexillo breviores; carinæ petala vexillum parum excedentia rostrata a basi late cohærentia. *Staminum* antheræ alternæ longæ basifixæ alternæ breves versatiles. *Ovarium* $\frac{1}{6}$ poll longum ovoideum pubescens; stylus $\frac{1}{2}$ poll. longus abrupte deflexus dum recurvus superne intus barbatus. *Legumen* pubescens oblongum polyspermum turgidum.

Socotra. On the hills south-west of Galonsir. B.C.S. n. 140.

Distrib. Endemic.

A curious trailing plant, which is referred to this genus, with the majority of characters of which it conforms; but it has a calyx quite exceptional in the genus, and the winged pedicel is also an aberrant feature. An Abyssinian plant *C.* (Phyllocalyx) *Quartiniana*, Baker (in Oliv. Flor. Trop. Afr. ii. 42), has a large calyx of somewhat like character.

2. PRIOTROPIS.

Priotropis, Wight and Arn. Prod. 180; Benth. et Hook. Gen. Pl. i. 480.

A genus of two species only, one of which is limited to the mountainous regions of eastern India, and the other is Socotran.

P. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 509. Tab. XV.

Fruticosa; foliis trifoliolatis, foliolis oblongo-ellipticis obtusis emarginatis brevissime petiolatis; pedicellis brevibus; legumine longe stipitato longitudine dimidio latitudinem excedente pubescente 2-spermo.

Frutex 10-pedalis habitu *Laburni* ramulis pubescentibus. *Folia* trifoliolata petiolo striguloso 1–1¾ poll. longo; foliola 1¼–1¾ poll. longa ⅔–¾ poll. lata oblongo-elliptica obtusa emarginata subapiculata brevissime petiolulata (petiolulo piloso) supra glabra infra subtiliter brevissime strigulosa membranacea conspicue curvatim venosa. *Stipulæ* setiformes. *Racemi* terminales ramosi pilis brevibus adpressis vestiti; pedicelli ⅓ poll. longi bibracteolati, bracteolis minutis. *Calyx* poculiformis ¼ poll. longus extus pubescens, lobis acutis subæqualibus tubo subæquilongis. *Corolla* longe exserta; vexillum unguiculatum subrotundatum emarginatum ⅝ poll. longum; alæ oblongæ; carina rostrata. *Ovarium* longe stipitatum compressum dense pilis adpressis vestitum; stylus ¼ poll. longus lateraliter compressus. *Legumen* ½ poll. longum ¼ poll. latum pubescens 2-spermum compressum, stipite calyci æquilongo.

Socotra. A shrub of the higher levels on the Haghier hills. B.C.S. n. 688, Schweinf. n. 645.

Distrib. Endemic.

In this plant we have a species of a hitherto monotypic Indian genus. *P. cytisoides*, Wight and Arn. (Prod. 180; Baker in Hook. Flor. Brit. Ind. ii. 65), the species on which the genus was founded, is a plant of the tropical parts of the eastern Himalayas—from Khasia to Sikkim, and the occurrence of this second species in Socotra is an interesting fact of distribution. From the Himalayan type the Socotran plant is distinguished by its obtuse not pointed leaves, and by its shorter and narrower legumes.

3. TRIGONELLA

Trigonella, Linn. Gen. n. 898; Benth. et Hook. Gen. Pl. i. 486.

A considerable genus of, frequently odorous, herbs, dispersed over Europe, Asia, and North Africa. A few occur at the Cape, and one in Australia.

T. falcata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 509.

Annua; foliis trifoliolatis, foliolis obovato-cuneatis, terminali longe petiolato; inflorescentia capitato-racemosa 2–5-flora foliis brevior; calycis laciniis linearibus tubo multobrevioribus; stylo ovario multobreviore; legumine falcato longo tenui.

Herba ramosa ramis subdecumbentibus parum elongatis quadrangulis striatis glabris. *Folia* $1\frac{1}{4}$ poll. longa trifoliolata, petiolo capillari $\frac{1}{3}$–$\frac{2}{3}$ poll. longo; foliola membranacea obovato-cuneata dentata sæpe emarginata sparsim hirta, terminali maximo cum petiolulo $\frac{1}{6}$ poll. longo. *Stipulæ* semisagittatæ, inferioræ basi unilateraliter arcte incisæ. *Rhachis* inflorescentiæ $\frac{1}{4}$–$\frac{1}{3}$ poll. longa filiformis hirtella foliis brevior apice ultra 2–5 flores croceos brevissime pedicellatos aristata; pedicelli $\frac{1}{24}$ poll. longi. *Calyx* $\frac{1}{9}$ poll. longus pilis paucis adpressis vestitus, laciniis linearibus $\frac{5}{8}$ lin. longis. *Corolla* $\frac{1}{5}$ poll. longa; vexillum unguiculatum ellipticum. *Ovarium* $\frac{1}{7}$ poll. longum compressum lineare pubescens; stylus $\frac{1}{12}$ poll. longus. *Legumen* valde arcuatum lineare leviter compressum fere 1 poll. longum $\frac{1}{24}$ poll. latum subglabrum (juvenili hirtello) nervis duobus suturalibus validis lateribusque oblique elevatim nervoso-reticulatis. *Semina* 12 oblonga levia.

Socotra. Sandy places. B.C.S. n. 665.

Distrib. Endemic.

A species nearly allied to *T. hamosa*, Linn. (Sp. 1094; Sibth. Fl. Græc. t. 764), a native of Nile Land, Egypt, and the Cape, but not found further eastwards, unless *T. uncata*, Boiss. et Noë (Diagn. ser. ii. 2. 12; Boiss. Flor. Orient. ii. 84), be the same species. This latter one, which is found through Syria, Persia, and Afghanistan, differs from *T. hamosa* only in the calyx, which has laciniæ about $\frac{1}{3}$ the length of the tube, whilst in *T. hamosa* the calyx tube is only slightly toothed.

The Socotran plant resembles most Boissier's species, as it has calyx lobes nearly half the length of the tube, but it differs from both of them in the short peduncles of the inflorescence, the style greatly shorter than the ovary, and in the long thin many-seeded pods, and upon all of these characters the species is constituted.

4. MEDICAGO.

Medicago, Linn. Gen. n. 899; Benth. et Hook. Gen. Pl. i. 487.

A considerable genus, ranging through Europe, western Asia, and northern Africa, and containing several species introduced and now common weeds in many parts of the world. The three Socotran species have a wide distribution, almost that of the genus.

M. denticulata, Willd. Sp. iii. 1414; DC. Prod. ii. 176; Baker in Oliv. Flor. Trop. Afr. ii. 51, and in Hook. Flor. Brit. Ind. ii. 90; Boiss. Flor. Orient. ii. 102; Syme Eng. Bot. t. 338.

Socotra. Common on the plains. B.C.S. n. 666.

Distrib. Northern hemisphere of the old world.

The Socotran plant appears to be the form described by Willdenow as *M. apiculata*, having short spines and few spires to the fruit.

M. minima, Lamk. Dict. iii. 636; DC. Prod. ii. 178; Baker in Oliv. Flor. Trop. Afr. ii. 51, and in Hook. Flor. Brit. Ind. ii. 91; Boiss. Flor. Orient. ii. 103; Syme Eng. Bot. t. 340.

Socotra. Common. B.C.S. n. 667.

DISTRIB. Europe and west Asia, extending to Abyssinia and to Afghanistan and Kashmir.

M. laciniata, All. Flor. Ped. i. 316; DC. Prod. ii. 180; Baker in Oliv. Flor. Trop. Afr. ii. 51, and in Hook. Flor. Brit. Ind. ii. 90; Boiss. Flor. Orient. ii. 104.

Socotra. On sandy plains. B.C.S. n. 668.

DISTRIB. From the Canary Islands and Mediterranean region eastwards to Beloochistan, in Abyssinia, and at the Cape.

5. MELILOTUS.

Melilotus, Juss. Gen. 356; Benth. et Hook. Gen. Pl. i. 487.

A small genus of temperate and subtropical regions in the northern hemisphere of the old world Some forms are now cosmopolitan weeds.

M. parviflora, Desf. Atl. ii. 192; DC. Prod. ii. 187; Baker in Oliv. Flor. Trop. Afr. ii. 52, and in Hook. Flor. Brit. Ind. ii. 89; Boiss. Flor. Orient. ii. 108.

Socotra. Common. B.C.S. n. 351.

DISTRIB. A common tropical weed.

6. LOTUS.

Lotus, Linn. Gen. n. 897; Benth. et Hook. Gen. Pl. i. 490.

A genus widely spread in the temperate zones and upon mountains in tropical regions of both hemispheres. Of the three representatives in Socotra, one is an African and south-west Asiatic species, the other two are endemic, and are interesting in connection with the constitution of the genus.

The two endemic species are *L. ononopsis* and *L. mollis.* Their affinity is with *L. Garcini,* DC. (Prod. ii. 212; Baker in Oliv. Flor. Trop. Afr. ii. 63), a plant of Nile Land, Persia, and Scindh; but from it there is in each case considerable specific difference. All three species occupy an exceptional position in the genus Lotus. Whilst possessing the habit and the majority of Lotoid characters, in their leaves and their anthers they diverge from the type of Lotus and approach Ononis, from which, however, their inflorescence, diadelphy, and the absence of stipules separate them.

Jaubert and Spach (Ill. Pl. Orient. i. 96) describe and figure a plant from Persia as *Ononis Aucherii,* creating for it at the same time a sub-genus, Lotopsis, characterised by the solitary axillary flowers, and by the absence of stipules.

This plant, as Bentham and Hooker (Gen. Pl. I. 485) point out, is *L. Garcini*, DC., and they suppress the sub-genus Lotopsis, preferring to retain the plant in the genus Lotus.

It is a fact of considerable interest to find in Socotra two species aberrant from the generic type of Lotus on the same lines as *L. Garcini*.

It is a question then how far such variation is permissible in Lotus, and whether the peculiarities exhibited by these three species are not to be considered generic. We are certainly, I think, justified in establishing a distinct sub-genus in Lotus for their reception, and this I name and characterise thus :—

Sub-genus—**Ononidium**, Balf. fil.

Folia trifoliolata; flores solitarii axillares; staminum filamenta alterna sursum dilatata, antheræ alternæ versatiles alternæ paullo longiores et basifixæ.

This sub-genus includes at present the three species *L. Garcini*, DC., *L. ononopsis*, Balf. fil. and *L. mollis*, Balf. fil. A fourth species, *L. Stocksii*, Boiss. (Flor. Orient. ii. 174), will also belong to this sub-genus if it is distinct from *L. Garcini*, DC., which I much doubt.

1. **L. arabicus**, Linn., var. **trigonelloides**, Webb et Berth. Phytog. Canar. ii. 86.

L. trigonelloides, Webb et Berth. Phytog. Canar. t. 65.

Socotra. On sandy plains. B.C.S. n. 669.

Distrib. From the Canary Islands through north Africa to Arabia and Persia.

The Socotran plant is very small and dwarfed.

2. **L.** (Ononidium) **ononopsis**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 509. Tab. XVI.

Diffusus fere omnino glaber subcrassus; foliis subsessilibus; foliolis lanceolatis et ad formas suborbiculares variantibus; floribus pedicellatis; calycis lobis subæqualibus; corolla exserta; stigmate capitato; legumine lineari glabro 8–12-spermo.

Perennis subsucculentus glaber pedicellis floribus partibusque juvenilibus subtiliter pilis adpressis vestitis exceptis, caule hypogæo lignoso cortice erythro. *Rami* elongati diffusi decumbentes $\frac{1}{2}$–2-pedales angulati complanati v. subalati striati. *Folia* trifoliolata sessilia v. subsessilia; foliola a forma lanceolata ad ellipticam v. obovatam v. orbicularem variantia acuta v. obtusa $\frac{1}{4}$–$\frac{1}{3}$ poll. longa $\frac{1}{8}$–$\frac{1}{4}$ poll. lata. *Stipulæ* nullæ. *Flores* solitarii in axillis foliorum pedicellati racemosque laxos paucifloros ita formantes; pedicelli $\frac{5}{12}$–$\frac{3}{4}$ poll. longi inferne recti et sparsim strigulosi, superne sub flore articulati et arcuati denseque strigulosi. *Calyx* $\frac{1}{4}$ poll. longus extus strigulosus, lobis subæqualibus acuminatis tubo æquilongis. *Corolla* aurea cum carinæ rostro purpureo; vexillum orbiculare unguiculatum $\frac{5}{12}$ poll. longum; alæ obovatæ v. subpanduriformes. *Stamina* diadelphia vagina extus scabrida, filamentis alternis sursum dilatatis; antheræ alternatim versatiles alternatim paullo longiores et basifixæ. *Stylus* $\frac{1}{5}$ poll. longus ovario æquilongus, stigmate capitato. *Legumen* $1\frac{1}{4}$ poll. longum $\frac{1}{24}$ poll. latum lineare glabrum subtorulosum intus septulatum 8–12-spermum. *Semina* levia.

Socotra. Abundant on the hills at a high altitude. B.C.S. nn. 400, 491. Schweinf. n. 555.

Distrib. Endemic.

A very attractive species, on account of its slightly fleshy character, its pale yellow-green foliage, and brilliant yellow flowers. It is essentially a plant of the higher regions of the island, and like many other Socotran plants it is somewhat diverse-leaved, at times showing almost orbicular forms, in other instances the shape is lanceolate or pointed.

3. L. (Ononidium) **mollis**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 509. Tab. XVII, A.

Diffusus canus dense strigosus; foliis sessilibus, foliolis oblanceolatis v. obcuneatis exstipulatis; floribus sessilibus v. subsessilibus; calycis lobis subæqualibus; corolla longe exserta; stigmate capitato; legumine lineari glabro 8-spermo.

Perennis depressus albidus mollis ramosissimus caule hypogæo lignoso, per totum albis pilis sericeis adpressis dense vestitus. *Rami* diffusi late depresso-decumbentes elongati pedales angulati sæpe internodiis brevibus. *Folia* trifoliolata sessilia sæpe conferta; foliola $\frac{1}{4}$–$\frac{1}{2}$ poll. longa $\frac{1}{12}$–$\frac{1}{8}$ poll. lata oblanceolata v. obcuneata obtusa v. subacuta mollissima. *Stipulæ* nullæ. *Flores* sessiles v. subsessiles axillares solitarii versus apicem ramulorum singillatim evoluti. *Calyx* $\frac{1}{5}$ poll. longus, lobis linearibus tubum æquantibus margine ciliatis extus dense sericeo-strigosis. *Corolla* aurea longe exserta; vexillum late obovatum emarginatum fere $\frac{5}{12}$ poll. longum; alæ oblongæ; carina obliqua subrostrata apice purpurea. *Stamina* diadelphia vagina extus scabrida filamentis alternis sursum dilatatis; antheræ alternæ versatiles alternæ paullo longiores et basifixæ. *Ovarium* breviter stipitatum; stylus $\frac{1}{5}$ poll. longus ovario æquilongus, stigmate capitato. *Legumen* $\frac{1}{2}$–$\frac{5}{6}$ poll. longum $\frac{1}{12}$ poll. latum calycem multo superans lineare subtorulosum glabrum. *Semina* circa 8 globularia levia.

Socotra. On the limestone cliffs south-west from Galonsir, at an altitude over 1300 feet. B.C.S. n. 670.

Distrib. Endemic.

A very characteristic plant of the lofty limestone plateau at the north-west end of the island. Easily distinguished from the preceding species by its soft leaves covered with silky white hairs.

7. PSORALEA.

Psoralea, Linn. Gen. n. 894; Benth. et Hook. Gen. Pl. i. 491.

A large genus, distributed over the whole world, but most abundant in south Africa and North America.

P. corylifolia, Linn. Sp. 1075; DC. Prod. ii. 218; Baker in Hook. Flor. Brit. Ind. i. 103; Bot. Mag. t. 665.

Socotra. About dwellings. B.C.S. n. 671.

Distrib. India and Ceylon, and in Arabia.

8. INDIGOFERA.

Indigofera, Linn. Gen. n. 889; Benth. et Hook. Gen. Pl. i. 494.

A very large genus of the warmer parts of the globe, attaining a maximum in tropical and south Africa. Ten species are found in Socotra. Of these, two are endemic; three are Arabian and south-west Asiatic species, one of them also reaching Nile Land; three are tropical African and southern Asiatic forms, two of which also extend to Australia; one is north Indian only, and the tenth is a widely cultivated species.

1. I. nephrocarpa, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 509. Tab. XVIII, A.

Depressa canescens; foliis alterne trifoliolatis petiolatis strigosis; stipulis inconspicuis; racemis paucifloris subsessilibus v. filiformiter pedunculatis; legumine minuto 1-spermo reniformi; stylo persistente.

Perennis depressa lignosa a basi ramosissima congesta v. diffusa. *Rami* humifusi sæpe late patentes fere pedales scabriduli. *Folia* alterne trifoliolata in formis congestis $\frac{1}{8}$–$\frac{1}{6}$ poll. longa brevissime petiolata dense pilis albis adpressis vestita, in diffusis $\frac{2}{3}$ poll. longa petiolo filiformi $\frac{1}{4}$ poll. longo sparsimque strigosa sed inter extremas multos gradus exhibentia; foliola obovata v. sæpe oblonga nec quam $\frac{1}{8}$ poll. longa majora subcrassa. *Stipulæ* minutæ inconspicuæ. *Flores* parvi 3–6 ad extremitatem rhacheos filiformis $\frac{1}{6}$–$\frac{1}{2}$ poll. longæ (in plantis congestis fere absentis) axillaris capitato-racemosæ conferti; pedicelli $\frac{1}{16}$ poll. longi; bracteolæ minutissimæ setiformes. *Calyx* $\frac{3}{16}$ poll. longus extus pilosus, lobis subulatis subæqualibus tubo multolongioribus. *Corolla* purpurea; vexillum orbiculare vix unguiculatum $\frac{1}{12}$ poll. longum extus pubescens; alæ angustæ truncatæ carina vexilloque parum breviores. *Stylus* ovario quadruplolongior multoincurvatus. *Legumen* $\frac{3}{16}$ poll. diam. reniforme curvatum strigosum stylo persistente longo terminatum 1-spermum.

Socotra. A common plant of the plains. B.C.S. nn. 85, 104, 336? Schweinf. n. 237.

Distrib. Endemic.

Amongst the one-seeded species of Indigofera this is easily recognised by its fruit, which is so much bent upon itself as to become quite kidney-shaped, and the long persistent style coils round it.

As is so common in Socotran plants, its appearance when growing on the harder portion of the limestone plains differs from its aspect when in more congenial localities. In the first-mentioned circumstances it forms a hard, tufted depressed plant (n. 85), with branches, at times almost spiny, always greatly shortened, and hence the leaves, and the flowers, and fruit, which latter are in almost sessile clusters, become aggregated into a compact form. When under more favourable conditions, it gives off spreading branches with elongated internodes, and the leaves are longly and delicately petioled, whilst the flowers and fruits are in capitate racemes on slender rhachi (n. 104).

We have a specimen (n. 336) from the island which I think is to be referred to this species, but the leaflets have become long linear lanceolate, often a half-

inch or more long. If this be so, the species exhibits variation in foliage similar to that we have described in *Crotalaria strigulosa*, Balf. fil. (see page 66).

2. **I. cordifolia,** Roth. Nov. Spec. 357; DC. Prod. ii. 222; Baker in Oliv. Flor. Trop. Afr. ii. 72, and in Hook. Flor. Brit. Ind. ii. 93.

Socotra. Common. B.C.S. n. 672. Schweinf. n. 272.

Distrib. From Nile Land through south-west Asia to the Malay Islands and north Australia.

3. **I. paucifolia,** Delile Flor. Egypt. 107, t. 37, ff. 2, 2′; DC. Prod. ii. 224; Baker in Oliv. Flor. Trop. Afr. ii. 88, and in Hook. Flor. Brit. Ind. ii. 97; Boiss. Flor. Orient. ii. 190; Wight Ic. t. 331.

Socotra. About Galonsir and elsewhere. B.C.S. n. 673.

Distrib. Tropical Africa, Arabia, and through south-west Asia to Java.

4. **I. intricata,** Boiss. Flor. Orient. ii. 190.

Nom. Vern. Sideri (Schweinf.).

Socotra. Very abundant on the plains, especially on Habidu plain. B.C.S. n. 107. Schweinf. n. 298.

Distrib. Arabia, Persia.

Our plant differs slightly from Boissier's Arabian and Persian types, as represented in Kew Herbarium from Aucher Eloy's collections, in having the leaves on young shoots unifoliolate and linear, reaching as much as $\frac{5}{12}$ inch long, and the pod is somewhat larger, sometimes $\frac{2}{3}$ inch long. Boissier describes the pedicels as exceeding the leaves. In our specimens the pedicels are shorter than the leaves.

The plant is said to be abundant about Mascate. It is a thoroughly desert species, being hard-wooded, much branched, and twiggy, sometimes almost spinose, and covered with a greyish-white indumentum. In Socotra the small dwarf bushes studding the plains at wonderfully regular intervals give a peculiar appearance to the landscape.

The nearest ally to this species is *I. spinosa*, Forsk., another Arabian form occurring also in India, Abyssinia, and Egypt.

5. **I. leptocarpa,** Hochst. et Steud. in herb. Schimp. Arab. n. 771 (*nom. sol.*); Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 510.

Socotra. On the limestone plains; not common. B.C.S. n. 674. Schweinf. n. 389.

Distrib. Arabia, Nubia.

The plant is not a conspicuous one, and the Socotran forms are rather more woody and rigid than the Arabian type. It is a thoroughly desert form. Schweinfurth informs me he has collected the plant in Nubia.

There are specimens in Kew Herbarium, collected near Jeddah by Schimper, and distributed under this name and number. There are also plants of the same species brought by Fischer from the same locality, but I do not find that the name has been anywhere taken up, and Hochstetter and Steudel do not appear to have published a description. Amongst my diagnoses of Socotran plants, I published one of this species, and I append here a fuller description,—

Herba humilis rigida cana strigosa basi ramosa. *Rami* internodiis longis late patentes decumbentes subfastigiati subcompressi angulati. *Folia* $\frac{1}{4}$–$1\frac{5}{2}$ poll. longa digitatim trifoliata petiolata (petiolo $\frac{1}{12}$–$\frac{1}{9}$ poll. longo); foliola omnia sessilia ovata v. elliptica acuta v. obtusa omnino rigide strigosa. *Stipulæ* $\frac{1}{8}$ poll. longæ. *Racemi* 5 poll. longi basi nudi floribusque versus apicem dispositis; pedicelli $\frac{1}{12}$ poll. longi; bracteolæ setiformes. *Calyx* $\frac{1}{9}$ poll. longus, lobis acutis superiore tubo æquilongo cæteris brevioribus. *Corolla* parva; vexillum $\frac{1}{6}$ poll. longum obovatum unguiculatum carina parum longior. *Ovarium* stylo crasso æquilongum. *Legumen* $\frac{2}{3}$–$1\frac{1}{2}$ poll. longum $\frac{1}{12}$ poll. latum lineare strigosum nec torulosum 6–8-∞-spermum.

6. **I. viscosa,** Lamk. Encyc. iii. 247; DC. Prod. ii. 227; Baker in Oliv. Flor. Trop. Afr. ii. 81, and in Hook. Flor. Brit. Ind. ii. 95; Boiss. Flor. Orient. ii. 189; Wight Ic. t. 404.

Socotra. Common on the limestone plains. B.C.S. n. 675. Schweinf. n. 719.

Distrib. From Cape de Verde Islands through tropical Africa and south-west Europe to the Eastern Archipelago and north Australia.

7. **I. marmorata,** Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 510. Tab. XVIII, B.

Suffruticosa argenteo-canescens; foliis alterne trifoliolatis v. pinnatis petiolatis; foliolis 3–7 oblanceolatis v. obovatis supra marmorato-strigosis; racemis paucifloris floribus secundis; legumine brevi subtetraquetro rostrato bispermo.

Suffrutex 5-pedalis argenteo-canescens ramulis elongatis juvenilibus multo compressis jugoque centrali prominente instructis. *Folia* $1\frac{5}{2}$–$1\frac{3}{4}$ poll. longa (petiolo $\frac{1}{6}$–$\frac{3}{4}$ poll. longo) decidua rarius trifoliolata sæpissime alterne pinnata; foliola 3–7, terminale maximum lineare basi gradatim attenuatum v. oblanceolatum truncatum mucronatum v. apiculatum et 1 poll. longum sed sæpe obovatum emarginatum v. retusum et $\frac{1}{6}$ poll. longum semper petiolulatum lateralia minora obovata v. obcuneata emarginata apiculata brevissime petiolulata, omnia plus minusve strigosa sed supra pilis adpressis in pannos densiores pinnatim aggregatis atque superficiem laminæ regulariter et marmoratim obtegentibus. *Stipulæ* minutæ obliquæ margine subfimbriatæ. *Racemi* axillares foliis longiores 2–8-flori, floribus secundis; pedicelli $\frac{1}{12}$ poll. longi; bracteolæ obsoletæ. *Calyx* $\frac{1}{12}$ poll. longus cyathiformis, lobis deltoideis æqualibus margine glandulis rufis ciliatis. *Corolla* luteo-purpurea petalis subæquilongis; vexillum sessile suborbiculare v. oblongo-orbiculare extus strigulosum $\frac{3}{10}$ poll. longum; alæ angustæ oblique obovatæ versus basim ubsaccatæ; carinæ petala later-

aliter longe saccata. *Stylus* longus incurvatus ovario triplolongior. *Legumen* sparsim strigosum ¼–½ poll. longum ⅛ poll. latum suturis ambis incrassatis lateraliter dilatatum subtetraquetrum apice subfalcatum rostratum bispermum.

NOM. VERN. Sidereh (B.C.S.).

Socotra. On the hill slopes at an elevation of over 1000 feet. B.C.S. n. 370. Schweinf. n. 503.

DISTRIB. Endemic.

A species of very striking character. Its fruit alone completely separates it from any described form, and coupled with its peculiar foliage, supplies an easily observed diagnostic mark. The foliage leaves are somewhat variable in form; especially is this the case in the terminal leaflets of the base of young shoots; but all present the curious mottled appearance on the upper surface, due to the distribution of the adpressed hairs, from which I have taken the specific name. These hairs are not uniformly disposed over the lamina, but on each side of the midrib densely clothed and sparingly covered patches alternate. The hairy patches extend from the midrib outwards and upwards to the margin of the lamina on each side, but the patches do not always correspond on opposite sides of the midrib, and thus a feathered appearance is produced on the surface. Usually there are two or three densely hairy patches on the smaller leaves; on the larger ones there may be many.

The local name for this species is apparently the same as for *I. intricata*, Boiss.

8. I. Gerardiana, Grah. in Wall. Cat. n. 5486; Baker in Hook. Flor. Brit. Ind. ii. 100.

Socotra. On the higher regions of the hills at an altitude over 2000 feet. Abundant on Haghier, south from Tamarida. B.C.S. n. 463. Schweinf. n. 595.

DISTRIB. From Afghanistan eastwards through the subtemperate and tropical Himalayan regions.

This very showy shrub, with flowers much larger than are common in the genus, has not hitherto been found west of Afghanistan. Our Socotran plant is undoubtedly the species, presenting only very slight differences from the type in the size and form of the leaflets. In the type these are lanceolate and rarely over a half-inch long. In our plant they are elliptic or elliptic oblong, with truncate or emarginate apices, and may be as much as one inch long.

A named variety—*heterantha*—of this species, with smaller and more numerous leaflets, is figured in the Botanical Register, 28, t. 57 as *Indigofera Dosua*. This is not, however, the true *Indigofera Dosua*, Hamilt. (see Baker in Hook. Flor. Brit. Ind. ii. 102).

9. I. tinctoria, Linn. Sp. 1061; DC. Prod. ii. 224; Baker in Oliv. Flor. Trop. Afr. ii. 99, and in Hook. Flor. Brit. Ind. ii. 99; Wight Ic. t. 365.

Socotra. Everywhere near villages on the plains. B.C.S. n. 676. Schweinf. n. 283.

DISTRIB. Universally cultivated in tropics.

10. I. **argentea**, Linn. Mant. 273; DC. Prod. ii. 224; Baker in Oliv. Flor. Trop. Afr. ii. 97, and in Hook. Flor. Brit. Ind. ii. 98; Boiss. Flor. Orient. ii. 190; L'Her. Stirp. t. 79.

Socotra. Common about Galonsir and Tamarida. B.C.S. n. 22.

DISTRIB. Nile Land, Arabia, Scindh.

9. TEPHROSIA.

Tephrosia, Pers. Synops. ii. 328; Benth. et Hook. Gen. Pl. i. 496.

A considerable genus, widely spread in warmer regions of both worlds, but with its headquarters in south Africa and tropical and subtropical Australia. A few species are North American. Of the six Socotran species, one is endemic, three are entirely tropical African, of which two are restricted to the northern districts, one species is common to north tropical Africa and south-west Asia, and the fifth is cosmopolitan in the tropics.

1. T. (Brissonia) **odorata**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Herbacea parva plusminusve strigosa; foliis digitatim trifoliatis; foliolis vix $\frac{1}{2}$ poll. longis oblanceolatis; stipulis minutis; floribus solitariis axillaribus odoratis purpureis.

Herba humifusa ramis strigosis. *Folia* digitatim trifoliata 1–1$\frac{1}{2}$ poll. longa, petiolo angulato; foliola subsessilia oblanceolata v. subcuneata circa $\frac{1}{2}$ poll. longa $\frac{1}{12}$–$\frac{1}{6}$ poll. lata acuta v. cuspidata v. truncata emarginata v. mucronulata venis parallelis a costa obliquis lineata subtus pilis adpressis vestita. *Stipulæ* liberæ setaceæ $\frac{1}{16}$ poll. longæ. *Flores* magni odori in cymas bifloras v. solitarias axillares dispositi; pedicelli strigosi $\frac{1}{4}$ poll. longi. *Calyx* 1$\frac{1}{6}$ poll. longus extus strigulosus lobis 2 superioribus in labium bifidum tubo vix æquilongum connatis. *Corolla* purpurea; vexillum $\frac{1}{2}$ poll. longum breviter unguiculatum orbiculare truncatum extus sparsim strigulosum; alæ falcatæ transversim plicatæ rugosæ; carinæ petala falcata obtusa alis latiora. *Staminum* filamenta apice non dilatata; antheræ muriformes alternæ basifixæ alternæ versatiles. *Ovarium* $\frac{3}{10}$ poll. longum breviter stipitatum 5-ovulatum pilisque adpressis dense vestitum; stylus incurvus longus intus apice longitudinaliter barbatus, stigmate obliquo. *Legumen* ignotum.

Socotra. On the cliffs south-west from Galonsir at an altitude over 1500 feet. B.C.S. n. 180.

DISTRIB. Endemic.

A lovely little species, with conspicuous purple flowers, and very strongly scented. We only found it in one locality near Galonsir.

It is very distinct, the trifoliolate leaves and the solitary axillary flowers being an uncommon feature in the section *Brissonia* to which it belongs, and with the small habit of the plant separate it from all other species.

2. T. (Reineria) **subtriflora**, Hochst. in herb. Schimp. Abyss. ed. Hohenack. n. 2312; Baker in Oliv. Flor. Trop. Afr. ii. 117.

Socotra. On the plains. B.C.S. n. 677.

DISTRIB. Abyssinia.

A small plant, of which we have two specimens with fruit only, appears to be this species, or one nearly allied to it. Our specimens differ from the type in the clothing of the stems. These have a covering of grey silky adpressed hairs, whilst in the Abyssinian plant the stems are coated with short spreading hairs. Our material is not sufficient to determine the identity with certainty.

3. T. (Reineria) **anthylloides**, Hochst. in herb. Kotschy. Nub. sect. i. n. 87; Baker in Oliv. Flor. Trop. Afr. ii. 118.

Socotra. On the plains. B.C.S. n. 168.

DISTRIB. Tropical Africa.

4. T. (Reineria) **vicioides**, Ach. Rich. Tent. Flor. Abyss. i. 188; Baker in Oliv. Flor. Trop. Afr. ii. 117.

Socotra. On the plains. B.C.S. n. 652. Schweinf. n. 295.

DISTRIB. Nubia, Abyssinia.

5. T. (Reineria) **purpurea**, Pers. Synops. ii. 329; DC. Prod. ii. 251; Baker in Oliv. Flor. Trop. Afr. ii. 124, and in Hook. Flor. Brit. Ind. ii. 112.

T. indigofera, Bert. Misc. xix. 9, t. 5.

Socotra. On the plains; common. B.C.S. n. 60.

DISTRIB. Cosmopolitan in the tropics.

The Socotran plant appears to be the form found in tropical Africa, and named by Baker as a variety—*pubescens*.

6. T. (Reineria) **Apollinea**, DC. Prod. ii. 254; Baker in Oliv. Flor. Trop. Afr. ii. 124; Boiss. Flor. Orient. ii. 192; Franch. Sert. Somal. in Miss. Révoil 28.

Galega Apollinea, Delile Flor. Egypt. 144, t. 53, f. 5.

Socotra. Common on the plains. B.C.S. nn. 30, 61, 71. Hunter n. 9.

DISTRIB. North-east tropical Africa, and through Arabia to Scindh.

10. TAVERNIERA.

Taverniera, DC. Mem. Leg. 339, t. 52; Benth. et Hook. Gen. Pl. i. 511.

A small genus of desert species inhabiting south-west Asia.

T. **sericophylla**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 510. Tab. XIX.

Suffruticosa argenteo-sericea; foliis alterne trifoliolatis dense sericeis; foliolis ellipticis; stipulis magnis late amplexicaulibus non-scariosis.

Suffrutex lignosus prorsus argenteo-sericeus ramis abbreviatis stipulorum baseisque persistentibus gerentibus. *Folia* alterne trifoliata petiolata 1½–2 poll. longa, petiolo ¼–¾ poll. longo geniculato et apice articulato subpersistente; foliola subcrassa mollissima elliptica obtusa sæpe subapiculata sinuata involuta ½–1 poll. longa $\frac{5}{12}$–½ poll. lata, terminali petiolulato. *Stipulæ* in squamas subovatas late amplexicaules nonscariosas oppositifolias ⅕ poll.

longas apice bifidas connatæ. *Racemi* breves 1¼ poll. longi 3–4-flori; pedicelli $\frac{1}{12}$ poll longi; bracteolæ obsoletæ. *Flores* mox decidui. *Calyx* ⅙ poll. longus extus sericeus, lobis subæqualibus apice setosis tubo parum longioribus. *Corolla* puniceo-purpurea; vexillum ⅓ poll. longum subrotundatum carina triente brevior. *Ovarium* biovulatum sericeum; stylus filiformis puberulus ovario dimidio longior. *Legumen* ignotum.

Socotra. On sandy spots near the sea at Galonsir, and on Kadhab plain. B.C.S. nn. 103, 338.

Distrib. Endemic.

A very distinct species. Most members of the genus are unifoliolate, and from the trifoliolate species, which are *T. lappacea,* DC. (Prod. ii. 339), from Nubia, *T. Stocksii,* Boiss. (Flor. Orient. ii. 509), from Beloochistan, and *T. Spartea,* DC. (*loc. cit.*), a Persian plant, the Socotran form is readily distinguished by its dense silvery silky covering, and by its large persistent not scarious stipules. We do not know the fruit of our plant, and a first glance might suggest its being an Indigofera, for like plants of that genus it contains a quantity of brilliantly coloured purple juice, easily expressed on squeezing the leaves; but it wants the hairs of Indigofera, and the stamens are not gland-tipped.

11. ORMOCARPUM.

Ormocarpum, Beauv. Flor. d'Ow. et Ben. i. 95, t. 58; Benth. et Hook. Gen. Pl. i. 515.

A small genus of, often glutinous, shrubs, one species of which is spread in Asia and Africa, three are peculiar to tropical Africa, two are Mexican, one is found in Australia, and one is Socotran.

O. cæruleum, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 511. Tab. XX.

Fruticosum; foliis imparipinnatis subsessilibus, foliolis 5–7 crassis glabris medio subtus porphyreo puberulo excepto; racemis brevibus paucifloris, pedicellis tenuibus sub floribus bibracteolatis; calyce glabro; corolla cærulea.

Frutex 10-pedalis ramis glabrescentibus erectis lignosis nunc paucifoliosis nunc spinosis angulatis et rugosis, juvenilibus terminalibus quadrangulatis elongatis puberulis, lateralibus sæpe contractis. *Folia* imparipinnata ½ poll. longa subsessilia v. brevissime petiolata (forsan petiolo $\frac{1}{12}$ poll. longo subtiliter puberulo) mox decidua ad ramos laterales conferta; foliola 5–7 sessilia v. subsessilia ⅕–⅓ poll. longa ⅙ poll. lata v. multo minora oblongo-elliptica v. obovata v. obcuneata crassa, supra glabra glanduloso-punctulata cum jugo medio caualiculato sursum evanescente, infra per aream mediam similem porphyreo-colorata subtiliterque puberula. *Stipulæ* parvæ ⅓ poll. longæ sublanceolatæ v. ovatæ subacuminatæ striatæ margine membranaceæ. *Racemi* axillares breves ⅔ poll. longi pauciflori sed sæpe abortu uniflori cum flore pseudoterminali; rhachis puberula 4–5-articulata nodis tumidis quoque cum 1–2 oppositis striatis puberulis subovatis v. ellipticis concavis ⅓ poll. longis bracteolis instructo; pedicelli tenues ⅛–⅙ poll. longi; involucrum bibracteolatum, bracteolis calycis basim amplectentibus. *Calyx* ⅕ poll. longus extus glaber, lobis tubo longioribus superioribus 2 subconnatis obtusis, caeteris lanceolatis. *Corolla* cærulea mox decidua; vexillum ½ poll. longum. *Ovarium* ⅕ poll. longum stipitatum; stylus $\frac{5}{12}$ poll. longus. *Legumen* perfectum non vidi sed immaturum breve glabrum venosum multoque compressum.

Nom. Vern. Hamerhamere.

Socotra. Not uncommon on the plains and on the hill slopes at low altitudes. B.C.S. nn. 80, 98, 293, 485. Schweinf. nn. 375, 498.

Distrib. Endemic.

A small shrub with beautifully coloured flowers. Its habit varies much with locality. On the limestone plains it forms a woody shrub bearing few very small leaves and short branches with a tendency to become spinose. Whilst in more favourable situations on the better soil of the hill slopes, it has long delicate less woody branches. A very curious feature in the plant is the coloured patch on the under surface of the leaves. This is spread over an area exactly similar to the extension on the upper surface of a median ridge which tapers off into the midrib near the apex of the leaf.

It is quite a distinct species. Probably its nearest ally is *O. Kirkii*, S. Moore (in Trim. Journ. Bot. N. S. vi. (1877), 290), a plant collected in Somali Land by Kirk and at Zanzibar by Hildebrandt; but it is a subaculeate form, and wants the coloration on the under surface of the leaf.

12. ARTHROCARPUM.

Arthrocarpum, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 510.

Calycis decidui tubus brevis, inferne angustus subcylindricus, supra ovarium connivens, lobi in labia 2 æquilongia dispositi, superior 4-dentatus latior, inferior integer angustior. Corolla basi calycem adhærens; vexillum orbiculatum, unguiculatum; alæ obliquiter oblongæ, transverse plicatæ; carina angusta, incurva, obtusa, alas subæquans, petalis vix cohærentibus. Stamina omnia in vaginam supra fissam connata, calycem adhærentia, filamentis non dilatatis; antheræ uniformes. Ovarium sessile, ∞-ovulatum, in tubo calycis inclusum; stylus filiformis, longissimus, leviter curvatus, stigmate minuto terminali. Legumen compressum, sericeo-pubescens, inter semina constrictum, articulis subellipticis utrinque alatis et bi-trinervoso-angulatis lignosis, endocarpio spongioso. Semina anguste obovoidea, strophiolata.—Arbor parva. Folia imparipinnata foliolis paucis exstipellatis. Stipulæ persistentes. Flores flavi axillares, solitarii v. rarius cymosim bini. Involucrum 4-bracteolatum, persistens.

A new monotypic and endemic genus of the *Hedysareæ*. It has all the characteristics of the sub-tribe *Æschynomeneæ*, and in general facies as well as in many technical characters closely resembles the group of American genera including *Chætocalyx*, *Nissolia*, &c. With the foregoing genus, *Ormocarpum*, it has also very strong affinities. From all the genera in the sub-tribe, however, it is distinguished by the very remarkable character of the calyx. The base of this is cylindrical, and forms a tube in which is included the ovary, and at the base of the style the tube is slightly constricted, again expanding upwards. Up to the top of the basal part of the tube the corolla and stamens are completely adherent to the calyx, and for a short distance above the constricted throat the corolla and stamens adhere. The whole appearance is thus

not unlike an epigyny. This is quite an exceptional feature in the tribe, and with other characters is sufficient to warrant the constitution of this new genus.

A. gracile, Balf. fil. (*loc. cit.*). Tab. XXI.

Arbor 30-pedalis ramulis strictis angulatis tenuibus pubescentibus. *Folia* $1\frac{1}{2}$–$1\frac{3}{4}$ poll. longa petiolata (petiolo $\frac{1}{2}$ poll. longo); foliola 5–7 longe obovata et ad basim attenuata breviter petiolulata $\frac{1}{2}$–1 poll. longa obtusa emarginata v. apiculata integra supra glabra viridia subtus albida v. pallidiora obscureque puberula. *Stipulæ* $\frac{1}{10}$ poll. longæ subulatæ pubescentes. *Pedicelli* tenues strigulosi $\frac{1}{2}$–$\frac{5}{6}$ poll. longi; bracteolæ involucri imbricatæ late obovatæ cuspidatæ $\frac{1}{10}$ poll. longæ extus pubescentes. *Calyx* extus adpresse puberulus, tubo $\frac{1}{6}$ poll. longo, labio superiore oblongo $\frac{1}{3}$ poll. longo, inferiore lanceolato. *Corollæ* vexillum vix $\frac{1}{2}$ poll. diam. *Ovarium* glabrum breve $\frac{1}{10}$ poll. longum pauciovulatum; stylus glaber $\frac{1}{2}$ poll. longus exsertus. *Legumen* breve $\frac{3}{4}$ poll. longum $\frac{1}{3}$ poll. latum 2–5-articulatum sed sæpe abortu 1-articulatum.

Nom. Vern. Heimha (B.C.S.).

Socotra. On the hills near Tamarida and elsewhere. B.C.S. nn. 368, 449. Schweinf. n. 511.

Distrib. Endemic.

A very beautiful tree, and the only species of the genus known.

13. ZORNIA.

Zornia, Gmel. Syst. Nat. 1076; Benth. et Hook. Gen. Pl. i 518.

A small genus of American distribution, but with one south and west African species, and another (the plant in Socotra) polymorphous one, found everywhere in the tropics.

Z. diphylla, Pers. Synops. ii. 318; Baker in Oliv. Flor. Trop. Afr. ii. 158, and in Hook. Flor. Brit. Ind. ii. 147; Benth. in Mart. Flor. Bras. xv. i. 80, tt. 21, 22.

Socotra. On Haghier near Hadibu plain. B.C.S. n. 258.

Distrib. Everywhere in the tropics.

The Socotran plant is the commonest Asiatic and African form, with the leaflets of the lower leaves small and ovate, and those of the upper ones lanceolate and linear.

14. DESMODIUM.

Desmodium, Desv. Journ. Bot. i. (iii. 1813), 122, t. 5, f. 15; Benth. et Hook. Gen. Pl. i. 519.

A very large genus of tropical regions in both hemispheres, a few species extending into extra-tropical zones.

D. triflorum, DC. Prod. ii. 334; Baker in Oliv. Flor. Trop. Afr. ii. 166, and in Hook Flor. Brit. Ind. ii. 173.

D. triflorum, B., Wight Ic. t. 292.

Socotra. Not uncommon. B.C.S. n. 471.

Distrib. Cosmopolitan in the tropics.

15. ALYSICARPUS.

Alysicarpus, Neck. ex Desv. Journ. Bot. i. (iii. 1813), 120, t. 4, f. 8; Benth. et Hook. Gen. Pl. i. 522.

A genus generally distributed in tropical Asia and Africa. One species, that found in Socotra, is now common in America.

A. vaginalis, DC. Prod. ii. 353; Baker in Oliv. Flor Trop. Afr. ii. 170, and in Hook. Flor. Brit. Ind. ii. 158.

A. Harnieri, Schweinf. Reliq. Kotsch. 24, t. 19.

Socotra. Occasional weed. B.C.S. n. 380. Schweinf. n. 495.

Distrib. Tropics of old world. In America, introduced.

The form of this somewhat variable plant which occurs in Socotra, is that described as a species under the name *A. nummularifolium,* DC. (*loc. cit.*). It occurs both in the state with long delicate inflorescences and in that with clustered flowers.

16. TERAMNUS.

Teramnus, Swartz Flor. Ind. Occid. iii. 1238, t. 25; Benth. et Hook. Gen. Pl. i. 530.

A tropical genus of four species, of which two are American, and two are Asiatic, one of them reaching Africa.

T. labialis, Spreng. Syst. Veg. iii. 235; Baker in Oliv. Flor. Trop. Afr. ii. 180, and in Hook. Flor. Brit. Ind. ii. 184.

var. **mollis,** Baker in Hook. Flor. Brit. Ind. ii. 184.

Glycine mollis, Wight Ic. t. 168.

Kennedya arabica, Hochst. et Steud. in herb. Schimp. Arab. Sect. i. n. 900.

Socotra. At Tamarida and Galonsir. B.C.S. nn. 143, 243. Schweinf. n. 287.

Distrib. Tropics of both hemispheres.

The Socotran plant is clothed with long spreading hairs, such as occur in the variety *mollis,* and in the type of *Kennedya arabica,* Hochst. et Steud.

17. ERYTHRINA.

Erythrina, Linn. Gen. n. 855; Benth. et Hook. Gen. Pl. i. 531.

A world-wide genus in warmer regions, containing only a few species.

Erythrina sp.

A species of *Erythrina* occurs on the island. It is a plant, so far as our specimens show, with a thin very fibrous bark bearing strong dark-brown prickles, slightly decurved, ¾ inch long, clothed at the base with a short grey tomentum. The leaves, of which we have but a few, are all obtuse and emarginate, wide and suborbicular. Unfortunately we have no flower, and the material is not sufficient for determination.

Socotra. Hills south from Tamarida. B.C.S. n. 653.

18. CANAVALIA.

Canavalia, Adans. Fam. ii. 325 (*Canavali*); DC. Mem. Leg. 375; Benth. et Hook. Gen. Pl. i. 537.

A small genus of wide distribution in the tropics.

C. ensiformis, DC. Prod. ii. 404; Baker in Oliv. Trop. Afr. ii. 190, and in Hook. Flor. Brit Ind. ii. 195.

C. polystachya, Schweinf. Reliq. Kotsch. 25, t. 20.
Dolichos gladiatus, Jacq. Icon. Bot. t. 560.

Nom. Vern. Dhoodha (B.C.S.).

Socotra. On the hill slopes. Not uncommon. B.C.S. n. 424.

Distrib. Tropics generally.

19. VIGNA.

Vigna, Savi Mem. Phas. iii. 7; Benth. et Hook. Gen. Pl. i. 539.

A widely dispersed tropical genus.

V. luteola, Benth. in Mart. Flor. Bras. xv. i. 194, t. 50, f. 2; Baker in Oliv. Flor. Trop. Afr. ii. 205, and in Hook. Flor. Brit. Ind. ii. 205.

Nom. Vern. Habetli (B.C.S).

Socotra. Common. B.C.S. n. 377. Schweinf. nn. 462, 500.

Distrib. Cosmopolitan in the tropics and at the Cape.

20. CYLISTA.

Cylista, Ait. Hort. Kew. ed. 1, iii. 512; Benth. et Hook. Gen. Pl. i. 542.

A monotypic genus, very near *Rhynchosia*, but distinguished therefrom by its peculiar membranous irregular calyx; hitherto known only in the Indian peninsula and in Mauritius.

C. scariosa, Ait. (*loc. cit.*); DC. Prod. ii. 410; Baker in Hook. Flor. Brit. Ind. ii. 219; Roxb. Pl. Cor. i. 62, t. 92.

NOM. VERN. Sedhat (B.C.S.).

Socotra. A not uncommon twiner on the hill slopes. B.C.S. n. 382. Schweinf. n. 534.

DISTRIB. Of the genus.

In Baker's account of the British Indian Leguminosæ, the Indian peninsula alone is mentioned as a habitat for this plant. But in Kew Herbarium I find a single specimen labelled "Ins. Maurit., Telfair." It is not, however, referred to as a Mascarene plant in Baker's Flora of Mauritius and Seychelles.

The Socotran plant, which has a more falcate and less widely expanded odd calyx-lobe, and thinner and less hairy leaves than in the Indian and Mascarene type, is an interesting find, forming a centre connecting the extreme areas of distribution of the species as hitherto known.

21. RHYNCHOSIA.

Rhynchosia, Lour. Flor. Cochinch. 460; Benth. et Hook. Gen. Pl. i. 542.

A large genus of the warmer regions of the globe. Some species are extra-tropical in South America and south Africa. One Socotran species is cosmopolitan in the tropics, the other is a tropical African and south-west Asiatic species.

1. R. minima, DC. Prod. ii. 385; Baker in Oliv. Flor. Trop. Afr. ii. 219, and in Hook. Flor. Brit. Ind. ii. 223; Benth. in Mart. Flor. Bras. xv. 204, t. 54, f. 2.

Socotra. Common. B.C.S. nn. 145, 266. Schweinf. n. 712.

DISTRIB. Cosmopolitan in the tropics. Cape and United States.

2. R. Memnonia, DC. Prod. ii. 386; Baker in Oliv. Flor. Trop. Afr. ii. 220, and in Hook. Flor. Brit. Ind. ii. 224; Boiss. Flor. Orient. ii. 625.

R. pulverulenta, Stocks in Hook. Kew Journ. Bot. iv. (1852), 147; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 17.

Dolichos Memnonia, Delile Flor. Egypt. 110, t. 38, f. 3.

Socotra. On the hill slopes. Common. B.C.S. n. 458. Schweinf. n. 801.

DISTRIB. Tropical Africa, Arabia, and Scindh.

The Socotran plant is the form found in Arabia and Scindh, which has been described as *R. pulverulenta* by Stocks. This Baker refers to De Candolle's tropical African species, and I think rightly. It differs from the type *R. Memmonia* in its less whitely pubescent and less prominently veined leaves, in the inflorescence, calyx-teeth, and the coloration of the seeds, and also in having smaller

pods. From extreme forms exhibiting these differences, there appears to be a complete series of transition stages to the type; the most constant of all the differences is the colour on the seed coat, which in true *R. Memnonia* is mottled, in *R. pulverulenta* is monochrome.

22. CASSIA.

Cassia, Linn. Gen. n. 514; Benth. et Hook. Gen. Pl. i. 571.

A large genus, widely dispersed in warm and tropical countries of both old and new worlds, especially abundant in the latter. Of the five species in Socotra, two are tropical cosmopolitan, one is common in the old world tropics, and two are tropical African and south-west Asiatic and Indian.

1. C. Sophera, Linn. Sp. 542; DC. Prod. ii. 492; Oliv. Flor. Trop. Afr. ii. 274; Baker in Hook. Flor. Brit. Ind. ii. 262.

C. chinensis, Jacq. Icon. Bot. t. 73.

Socotra. Common about villages on the plains. B.C.S. n. 5. Schweinf. n. 384.

Distrib. Cosmopolitan in the tropics. Said to be indigenous only in Asia.

Most of the Socotran plants have small leaves and fewer leaflets than usual. Boissier says it is frequent in the vicinity of Mascate on the Arabian coast. Schweinfurth notes "leguminibus teretibus!" on his specimens.

2. C. Tora, Linn. Sp. 538; DC. Prod. ii. 493; Oliv. Flor. Trop. Afr. ii. 275; Baker in Hook. Flor. Brit. Ind. ii. 263.

Socotra. In the vicinity of villages. B.C.S. n. 658.

Distrib. Cosmopolitan in the tropics.

3. C. obovata, Collad. Hist. Cass. 92, t. 15A; DC. Prod. ii. 492; Oliv. Flor. Trop. Afr. ii. 277; Boiss. Flor. Orient. ii. 631; Baker in Hook. Flor. Brit. Ind. ii. 264.

Socotra. Near Tamarida. Schweinf. n. 335.

Distrib. Tropical Africa, and from Arabia eastwards to the Indian peninsula.

Schweinfurth, who has alone got this from Socotra, tickets it as "aff. C. obovatæ sed foliis carnosulis aliisque notis diversa," but it appears to be only this species.

4. C. holosericea, Fresen. in Flora 1839, 54; Oliv. Flor. Trop. Afr. ii. 278; Franch. Sert. Somal. in Miss. Révoil 30.

Senna ovalifolia, Batka Monog. Senn. 35, t. 4.

Socotra. Common on the plains about villages. B.C.S. n. 654. Schweinf. n. 330.

DISTRIB. Nile Land and Arabia to Scindh.

5. C. Absus, Linn. Sp. 537 ; DC. Prod. ii. 500 ; Oliv. Flor. Trop. Afr. ii. 279 ; Baker in Hook. Flor. Brit. Ind. ii. 265.

Socotra. Not common near habitations. B.C.S.n. 655.

DISTRIB. Common in the tropics of the old world.

23. TAMARINDUS.

Tamarindus, Linn. Gen. n. 46 ; Benth. et Hook. Gen. Pl. i. 581.

Monotypic. The only species now cultivated everywhere in the tropics.

T. indica, Linn. Sp. 48 ; DC. Prod. ii. 488 ; Oliv. Flor. Trop. Afr. ii. 308 ; Baker in Hook. Flor. Brit. Ind. ii. 273.

T. officinalis, Hook. Bot. Mag. t. 4563.

NOM VERN. Sobha (B.C.S.).

Socotra. A few trees in several localities. B.C.S. n. 414.

DISTRIB. Of the genus.

24. ENTADA.

Entada, Adans. ex DC. Mem. Leg. 419, tt. 61, 62 ; Benth. et Hook. Gen. Pl. i. 589.

A small genus, chiefly of African species, a few are American, and one is a common tropical weed.

Entada sp.

A beautiful and graceful tree, of which our material is too fragmentary to permit identification, is provisionally referred to this genus. It has some resemblance with *Acacia pennivenia,* Schweinf. (see page 88), and the inhabitants of Socotra give to it the same name. The following is a brief description, so far as our specimens allow :—

Arbor gracilis glabra ramis elongatis pendulis leviter verrucosis ; foliis tenuibus bipinnatis 3½ poll. longis, pinnis 2–3-jugis 1½ poll. longis, foliolis 11–17 oppositis v. subopppositis v. alternis oblanceolatis v. obcuneatis sessilibus glaucis ¼–5/12 poll. longis 1/12–⅛ poll. latis ; stipulis non-spinosis caducis.

NOM VERN. Tomhor (B.C.S.).

Socotra. On the slopes of Haghier. B.C.S. n. 635.

25. DICHROSTACHYS.

Dichrostachys, DC. Mem. Leg. 428, t. 67 ; Benth. et Hook. Gen. Pl. i. 592.

A small genus of tropical Africa and Asia, and also found in Australia

D. dehiscens, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 511. Tab. XXII.

Fruticosus; ramulis foliisque juvenilibus pubescenti-hirtis; pinnis 2–5-jugis glandulis stipitatis, foliolis 8–15-jugis oblongis obliquis; spicis cylindraceis; legumine dehiscente.

Frutex glabrescens ramis teretibus ramulisque juvenilibus angulosis pubescenti-hirtis axillaribus sæpe spinosis. *Folia* ungue molli terminata pinnis 2–5-jugis rhachi cum glandulo umbilicato stipitato inter jugas instructa; foliola sessilia 8–15-juga obliqua oblonga submucronulata $\frac{1}{9}$ poll. longa. *Flores* in spicas densas solitares axillares pedunculatas $1\frac{1}{6}$ poll. longas congesti. *Bracteæ* scaphoideæ minutæ ciliatæ calyci subæquilongæ. *Calyx* minute dentatus $\frac{1}{16}$ poll. longus breviter ciliatus. *Corolla* $\frac{1}{8}$ poll. longa deltoideo-lobata, petalis per partem superiorem quartam liberis; glandulæ staminibus breviores. *Staminodia* contorta. *Ovarium* breviter stipitatum villosum. *Legumen* planum rectum v. vix tortuosum oblanceolatum, $1\frac{1}{2}$ poll. longum $\frac{1}{3}$ poll. latum 4–5 ad apicem pedunculi conferti, valvis extus pubescentibus sublignosis maturibus recurvis *Semina* $\frac{1}{5}$ poll. diam. exalbuminosa.

Socotra. On Kadhab and Hadibu plains. B.C.S. n. 365. Schweinf. n. 689.

Distrib. Endemic.

The facies of this plant is decidedly Dichrostacyoid, yet it is not without violence to the generic character that it is included in the genus. Like all the genera of the Mimosean tribe *Adenantherea*, this genus has exalbuminous seeds. It has also a dehiscent thick legume. Now in both these characters our plant differs from the generic type, and resembles the genera of the tribe *Piptadenieæ*, and in that tribe its nearest ally is *Piptadenia* itself. But as the whole habit, the presence of neuter flowers at the base of the spikes, and the stipitate glands between the pairs of pinnæ on the leaves are so characteristic of *Dichrostachys*, and as *Piptadenia* is essentially an American genus, having only three specific representatives in the old world, we have placed our plant in the genus *Dichrostachys*.

26. ACACIA.

Acacia, Willd. Spec. Pl. iv. 1049; Benth. et Hook. Gen. Pl. i. 594.

A vast genus of warmer regions, especially abundant in Australia and Africa. There are three species in Socotra, and of them two are endemic, and the third, as yet imperfectly known, is probably also endemic.

1. A. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 511. Tab. XXXIII.

Suffruticosa glabrescens; spinis primum tomentosis rectisque, demum glabris apiceque lente recurvis foliis æquilongis; pinnis 7–8-jugis, foliolis 10–20-jugis parvis oblongis obtusis; involucello pedunculi persistente; legumine stipitato foliis duplolongiore marginibus planis valvisque velutinis nervosis lignosis.

Suffrutex spinosus cortice papyraceo glabrescens. *Rami* subprostrati, ramuli juveniles pubescentes v. subtomentosi. *Spinæ* stipulares $\frac{3}{4}$–2 poll. longi primum tomentosæ rectæ demum glabræ albidæ apiceque lente recurvatæ subfusco-nigræ. *Folia* bipinnata apice subspinosa rhachi pubescente prope basim glandula unica concava substipitata pilis radiatis cincta instructa; pinnæ 7–8-jugæ subspinosæ; foliola 10–20-juga oblonga obtusa subtus pallidiora

$\frac{1}{8}$ poll. longa. *Pedunculi* axillares 1–3-conferti pubescentes $\frac{1}{2}$ poll. longi. *Involucellum* 5-lobatum. *Capitulum* globosum. *Flores* pilosi. *Calycis* dentes subciliati rotundati $\frac{1}{12}$ poll. longi. *Corolla* $\frac{1}{8}$ poll. longa, petalis in parte superiore quarta liberis laciniis deltoideis. *Legumen* stipitatum 4–5$\frac{3}{4}$ poll. longum $\frac{1}{2}$ poll. latum compressum vix lente curvatum v. fere subfalcatum ad extremitates ambos angustatum subtorulosum, marginibus planis, valvis lignosis intus septulatis extus convexis obscure lineari-venosis. *Semina* 6–8 globosa fusco-nigra.

NOM. VERN. Sumach (B.C.S.).

Socotra. On the plains near the sea on the north side of the island, especially in the vicinity of Delishi. B.C.S. n. 191. Schweinf. n. 260.

DISTRIB. Endemic.

This gummiferous acacia is a very distinct species, referable to the vicinity of *A. abyssinica*, Hochst. (Benth. Monog. Mimos. 510), and *A. nubica*, Benth. (*loc. cit.* 511), the habitats of which are indicated by their names. The last mentioned, however, probably extends into Arabia about Mascate. Our plant may be readily distinguished from *A. abyssinica*, by its shorter petioles, long spines equalling the leaves, and by the woody and velvety valves of the pods. From *A. nubica* its flat-margined pod-valves, as well as the long spines, separate it. Bentham (*loc. cit.*) notes that *Mimosa örfata*, Forsk. (Flor. Ægypt. Arab. 177), must be near his *A. nubica*, but its spines are described as equalling in length the leaves. By this character it would approach more nearly our Socotran plant.

The bush is very common on the plains in many places. About Delishi, a village east from the Hadibu plain, there are a great number of plants, and there it is that the inhabitants collect the gum in quantity. The gum exudes in tears, and is called " Sumach," the same name as is given to the bush. Although they collect gum, the only use, so far as I could learn, to which they put it is in making ink. It is a simple process. Some soot is mixed with water, and to the mixture a little powdered gum added. A small split stick serves as a pen.

For further remarks on the gum, see Appendix and Introductory Chapter.

2. A. pennivenia, Schweinf. in Proc. Roy. Soc. Edin. xiii. (1883). Tab. XXIV.

Arbor ramis glabris fuscis; foliis glaberrimis 2–3-pinnatis glandulis nullis; foliolis laxe 7–9-jugis oblongo-obovatis nervo fusco medio dimidiatis venis utrinque 3–4-pinnatis; floribus albis in capitula racemum laxum formantia v. subpaniculatim dispositis, involucello infra medium basin versus pedunculi griseo-tomentosi subcaduco; calycis lobis rotundato-ciliatis; corolla calyce dimidio longiore; staminibus exsertis; legumine ignoto.

Arbor 30-pedalis glaber. *Rami* fusci inermes lenticellis verrucosi, juveniles adventi angulosi nigri spinis binis stipularibus fuscis rectis divaricatis $\frac{1}{4}$–$\frac{1}{3}$ poll. longis basi incrassatis et connatis armati, fertiles congesti trifoliosi. *Folia* glaberrima 2–3-pinnata rhachi subalata 3 poll. longa basi incrassata glandulis nullis; pinnæ 2–3-jugæ 2$\frac{3}{4}$ poll. longæ laxe et alterne v. opposite 15–20-foliolatæ; foliola $\frac{1}{4}$–$\frac{1}{12}$ poll. longa $\frac{1}{4}$ poll. lata oblongo-obovata v. subobcuneata obtusissima v. emarginata basim versus gradatim acutata sessilia v. subsessilia

inæquilateralia subcrassa nervo medio fusco dimidiatis venis utrinque 3–4-pinnatis; folia ad ramos spinosos minora foliolaque pauciora. *Pedunculi* axillares griseo-tomentosi ½–¾ poll. longi ad apices ramorum defoliatorum pseudofasciculati, fasciculi racemum laxum formantes v. subpaniculati. *Involucellum* annulare trilobatum puberulum subcaducum. *Capitula* globosa; bracteolæ spathulato-lineares apice ciliatæ. *Flores* albi inodori. *Calyx* $\frac{1}{12}$ poll. longus bracteas æquans, lobis rotundatis brevissimis ciliatis. *Corolla* ⅛ poll. longa, lobis oblongis obtusis tubo dimidio brevioribus. *Stamina* triente corollam excedentia. *Ovarium* stipitatum glabrum; stylus infra apicem affixus dimidio ovario longior. *Legumen* ignotum.

Nom. Vern. Tamhor (Schweinf.).

Socotra. A handsome tree of the hill slopes of Haghier. B.C.S. nn. 212, 345. Schweinf. nn. 459, 519. Hunter n. 17.

Distrib. Endemic.

We only obtained specimens of this handsome tree in leaf, and with undeveloped flower buds, and whilst I could not identify it as a described species, I hesitated to found a new one upon our imperfect material. Schweinfurth fortunately got specimens in full flower, which warrant the constitution of a new species, and I have adopted the name he has suggested.

The plant belongs to the gummiferous section of the genus. Perhaps its nearest allies are, as Schweinfurth points out, *A. arabica*, Willd. (Sp. iv. 1085), and *A. Wightii*, Baker (in Hook. Flor. Brit. Ind. ii. 298). In the inflorescence, size of flower, ciliated calyx, and unarmed flower-branches, it comes especially near *A. arabica*, though it has more numerous flowers in the heads, and more stamens in each flower. In *A. horrida*, Willd. (Sp. iv. 1082) there is an inflorescence such as our plant shows, and in *A. nilotica*, Desf. (Cat. Hort. Par. ed. ii. 208, *A. vera*, Willd. Sp. iv. 1085), unarmed flowering branches are seen. The exact affinities cannot, however, be determined until we obtain fruit and seeds.

Like many plants from this region it shows adventitious twigs differing very markedly from the adult form, possessing features which are probably those of the young seedling plant. Only on such twigs (B.C.S. n. 345, Schweinf. n. 459) do we find spines; the ordinary branches of the adult plant are characteristically bare of them.

Camels are particularly fond of the twigs of this tree.

3. Acacia sp.

We have specimens in leaf of another species of Acacia belonging to the gummiferous section of the genus. It is a small dwarf spiny shrub of the limestone plains near the sea. We collected it near Galonsir. Our guides told us it was one of the gum-trees. I have not been able to match it with any described species, and our fragmentary specimens do not permit of a new specific determination. Schweinfurth, to whom I sent a portion, supposes it to

be an Aden species, probably *A. eburnea*, Willd. But I cannot find in Kew Herbarium any Aden plant like it, and it is very different from *A. eburnea* as there represented.

The following is a description so far as is possible:—

Suffrutex glaber ramis albidis striatis; spinis stipularibus nitentibus albis apice nigris divaricatis rectis foliis æquilongis v. longioribus; foliis bipinnatis, pinnis 1-jugis rhachi sub strumis villosa; foliolis 2–3-jugis $\frac{1}{6}$ poll. longis oblongis obtusis crassis glabris. Cæt. ignot.

Socotra. On the plains near Galonsir. B.C.S. n. 96.

Order XXVII. CRASSULACEÆ.

A considerable family, chiefly found in temperate and cooler regions of Europe, west Asia, south Africa, and North America. Of the two Socotran genera, one has a wide distribution over the globe, the other has a maximum in south Africa, but extends into Asia, and even to Brazil.

1. TILLÆA.

Tillæa, Linn. Gen. n. 177; Benth. et Hook. Gen. Pl. i. 657.

A cosmopolitan genus.

T. pentandra, Royle Illust. Bot. Himal. 222; Britten in Oliv. Flor. Trop. Afr. ii. 386; Clarke in Hook. Flor. Brit. Ind. ii. 412.

Socotra. Common on the hills. B.C.S. n. 560. Schweinf. n. 599.

Distrib. Across tropical Africa and on the Himalayas and Nilghiris.

2. KALANCHOE.

Kalanchoe, Adans. Fam. ii. 248; Benth. et Hook. i. 659.

A small genus, chiefly of tropical and south Africa, but ranging into tropical Asia, and one species reaches Brazil. Three of the Socotran species are endemic, and the fourth is south African.

1. K. rotundifola, Haw. Phil. Mag. 1825, 31; Harv. Flor. Cap. ii. 379.

Nom. Vern. Bugulhan (B.C.S.).

Socotra. On the higher parts of Haghier. B.C.S. n. 472. Schweinf. n. 752.

Distrib. South Africa.

I have not seen Haworth's description nor his specimens, and the identification is made on the basis of Harvey's statement. He, however, says, "I am uncertain whether this be Haworth's plant or not." Whether the plant referred to under this name by Harvey be Haworth's species or no, certain is it that our Socotran plant is the same as Harvey's Cape one. So that, if eventually Haworth's plant be proved to be a different species, it will not invalidate the

identification of a Socotran with a south African plant in this genus, which comprises such very local forms.

This Socotran plant we brought to England living, and it flowered at Kew in June 1881.

2. K. farinacea, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 512.

Caulescens glauca caule subtereti sæpe procumbente; foliis obovato-orbicularibus integris sessilibus subfarinaceis; inflorescentia terminali bipartim corymboso-paniculata compacta; corollæ tubo $\frac{1}{3}$–$\frac{5}{12}$ poll. longo; staminibus corollis vix æquilongis; squamulis linearibus obtusis integris; carpellis tubo corollæ æquilongis.

Glauca. *Caulis* erectus v. primum procumbens 6–12-pollicaris transverse rugosus subteres. *Folia* $1\frac{1}{2}$–2 poll. longa circa 1 poll. lata omnino obovato-orbicularia integra apice obtusa interdum emarginata sessilia late inserta, juniora farinacea. *Inflorescentia* terminalis compacta corymboso-paniculata rhachi glauca quadrangulari vix alata; bracteolæ minutæ subulatæ; pedicelli $\frac{1}{6}$ poll. longi. *Calyx* $\frac{1}{12}$ poll. longus ad medium 4-fidus, segmentis triangularibus incrassatis concavis erectis. *Corolla* flammea, tubo $\frac{1}{3}$–$\frac{5}{12}$ poll. longo glabro, limbi lobis oblongis ellipticis $\frac{1}{6}$ poll. longis acutis apice brunneo-punctatis. *Stamina* corollæ vix æquilonga. *Squamulæ* lineares apice obtusæ et rotundatæ integræ albæ $\frac{1}{12}$ poll. longæ. *Carpella* tubum corollæ æquantia glabra angusta; ovarium $\frac{1}{6}$ poll. longum in stylum persistentem gradatim attenuatum.

Socotra. Common on the limestone plains of the higher parts of the island. B.C.S. n. 521. Schweinf. n. 753. Hunter n. 15.

Distrib. Endemic.

A distinct species of the upper plains, occupying the crevices rotted in the limestone. It is now growing at Kew.

3. K. robusta, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 512.

Caulescens erecta valida glauca; foliis ad apicem caulis crassi aggregatis late insertis spathulatis magnis integris; floribus in terminales thyrsoideos paniculos dispositis; corollæ tubo circa 1 poll. longo; staminum filamentis tubo corollæ brevioribus versus apicem abrupte attenuatum; squamulis latis suborbicularibus integris; carpellis corollæ æquilongis.

Erecta robusta ramosa pedalis v. sesquipedalis. *Caulis* validus teres griseus rugosus basi sæpe $1\frac{1}{2}$ poll. diam. *Folia* $1\frac{1}{2}$–$2\frac{1}{4}$ poll. longa 1–$1\frac{1}{4}$ poll. lata ad apices ramorum evoluta elliptica v. oblonga obtusa sursum angustata basi in petiolum brevem attenuata glauca marginibus rubescentibus. *Inflorescentia* terminalis paniculata glauca; pedicelli $\frac{1}{2}$ poll. longi. *Calyx* 4-partitus segmentis acuminatis $\frac{1}{6}$ poll. longis glabris v. sparsim glandulosis. *Corolla* cinnabarina, tubo $1\frac{1}{8}$ poll. longo angusto subglabro, segmentis $\frac{1}{3}$ poll. longis $\frac{1}{8}$ poll. latis oblongis cuspidatis. *Stamina* exserta. *Squamulæ* rotundatæ subcrenatæ $\frac{1}{12}$ poll. longæ. *Carpella* $1\frac{1}{2}$ poll. longa glabra; ovarium $\frac{5}{6}$ poll. longum.

Socotra. On the plains at the east end of the island only. B.C.S. n. 151.

Distrib. Endemic.

A very clearly marked species. Of this one we brought home living specimens; one of these has flowered in the Royal Botanic Garden, Edinburgh, and from it our description is taken.

4. K. abrupta, Balf. fil. in Proc. Roy. Edin. xi. (1882), 512.

Caulescens erecta robusta, caule tereti griseo rugoso; foliis ad apices ramorum evolutis ellipticis v. oblongis obtusis vix petiolatis glaucis; inflorescentia terminali paniculata; corollæ tubo $1\frac{1}{8}$ poll. longo angusto; staminibus exsertis; squamulis rotundatis subcrenatis; carpellis corollæ æquilongis.

Erecta perennis pedalis v. sesqupedalis. *Caulis* crassus teres fulvus sæpe $\frac{1}{2}$ poll. diam. nonnunquam sed rarius ramosus transverse rugosus basi nudus apice foliis vestitus. *Folia* $3\frac{1}{2}$–4 poll. longa $1\frac{1}{4}$–$1\frac{3}{4}$ poll. lata omnino spathulata apice obtusa rotundata basi attenuata et late inserta glauca. *Inflorescentia* terminalis erecta valida glabra thyrsoideim et opposite ramosa ramis in corymbosas cymas divisis, rhachi terete; bracteolæ obovatæ; pedicelli crassi $\frac{1}{4}$–$\frac{1}{2}$ poll. longi. *Calyx* 4-partitus $\frac{1}{6}$ poll. longus lobis crassis remotis acutis. *Corolla* subinfundibuliformis flammeo-rubra, tubo $\frac{3}{4}$ poll. longo, limbi lobis $\frac{1}{4}$ poll. longis rotundatis cuspidatis crassis. *Stamina* omnia tubo corollæ breviora, filamentis versus apicem abrupte attenuatis. *Squamulæ* breves late lateraliter expansæ albidæ integræ crassæ. *Carpella* $\frac{5}{6}$ poll. longa glabra; ovarium $\frac{1}{4}$ poll. longum.

Socotra. Only on the plains towards the eastern end of the island. B.C.S. n. 512.

Distrib. Endemic.

Another new species of the stoutly caulescent group. It has the peculiar feature, which I do not find described in any other species, of the staminal filaments abruptly thinning into slender threads a short distance below the anther, so that they have an appearance as if there were an articulation at that point.

Order XXVIII. LYTHRARIEÆ.

A small family represented in all parts of the world. Two of the Socotran genera have the distribution of the order, the third is essentially Persian, but is now, by cultivation, found in all parts of the globe.

1. AMMANNIA.

Ammannia, Linn. Gen. n. 155; Benth. et Hook. Gen. Pl. i. 776.

A genus of species inhabiting marshy and moist regions of the warmer and tropical regions of the globe. Of the two Socotran species, one is an old world tropical form, the other is south-west Asiatic.

1. A. baccifera, Linn. Sp. 175; Hiern in Oliv. Flor. Trop. Afr. ii. 478; Clarke in Hook. Flor. Brit. Ind. ii. 569.

A. indica, Lamk. Illustr. i. 311; DC. Prod. iii. 77.

A. verticillata, Boiss. Flor. Orient. ii. 743.

Socotra. About Galonsir, Tamarida, and elsewhere. B.C.S. n. 511. Schweinf. nn. 230, 488, 688.

Distrib. Warmer regions of the old world.

2. **A. multiflora**, Roxb. Flor. Ind. i. 426; DC. Prod. iii. 79; Boiss. Flor. Orient. ii. 743; Clarke in Hook. Flor. Brit. Ind. ii. 570.

A. senegalensis, Lamk., var. *multiflora*, Hiern in Oliv. Flor. Trop. Afr. ii. 477.

Socotra. Near Galonsir. B.C.S. n. 714.

DISTRIB. India, Afghanistan, Persia, and tropical Africa ?

I am not certain that the tropical African plants are this species.

2. LYTHRUM.

Lythrum, Linn. Gen. n. 604; Benth. et Hook. Gen. Pl. i. 779.

A cosmopolitan genus.

L. hyssopifolium, Linn. Sp. 642; DC. Prod. iii. 81; Boiss. Flor. Orient. ii. 739; Jacq. Flor. Austr. ii. 20, t. 133.

Socotra. On the plains. B.C.S. n. 699.

DISTRIB. Widely spread over the globe. Absent from India.

3. PUNICA.

Punica, Linn. Gen. n. 618; Benth. et Hook. Gen. Pl. i. 784.

The genus *Punica*, presenting as it does a most peculiar feature in fruit structure, has been the subject of much investigation, and its position and affinities have been frequently debated. The plant from Socotra which we refer to this genus differs in a very remarkable way from the type of the genus in the fruit-character which has been its most distinguishing feature hitherto, and thus necessitates a modification in the generic description which I shall now notice. I shall, however, only say so much here regarding the structure of the fruit as may be required to explain the difference in the types, and as will suffice for a basis of a few remarks on the systematic position of the genus. In the Appendix will be found a fuller morphological account of the genus.

The true structure of the fruit was first satisfactorily indicated by Lindley (Introd. Syst. Nat. (1830, 64), and his account has been the basis of all subsequent explanations, the subsequent detailed work of Payer and Berg confirming the essentials of his description. The structure briefly is,—there are two rows of carpels, an upper, comprising five or more, with parietal placentas, and a lower of three or four, with central placentation. There appear, therefore, in the fruit to be two tiers of carpels superposed, each containing many seeds arranged on placentas of different position in the tiers. Development shows that these two tiers of carpels are primarily concentric whorls, the upper being at first outside the other; but in the evolution of the carpels the external whorl is carried upwards, and eventually lies above the other. An interesting further modification is described by Payer (Organogenie

467) in a variety cultivated in Paris as *Punica granatum flavum*, in which three tiers of carpels are found, and these are primarily concentric.

Now in our Socotran plant there is but one row of five to seven carpels, and in each carpel there are numerous ovules which are arranged over the floor of the loculus. In fruit it is found that they are spread over the walls of the loculi to some extent, the base of the ovary, as it were, having grown upwards, just as it does in many species of *Mesembryanthemum* (Eichler Blüthendiagr. ii. 123, f. 46). There is no trace of a second whorl of carpels; the only row present is that which becomes uppermost in the flowers with two and with three tiers; and it thus appears that we have in the Socotran plant a simpler condition of fruit of the type *Punica* than in the well-known pomegranate.

A frequent supposition regarding the pomegranate is that its fruit structure is a monstrous condition developed in cultivation, and we know it has been in cultivation for a very long period. Wight and Arnott (Prod. 327) indeed suggest "perhaps in a truly wild state the upper or adventitious verticel of carpels may occasionally disappear." But even from the districts where it is presumed to be wild—Persia, Kurdistan, Afghanistan, and Beloochistan—(see Alph. De Candolle Origine des Plantes Cultivées 1883, 189, for an interesting account of the source and early records of the pomegranate)—the pomegranate has been hitherto reported with the doubly verticillate carpels. Here, however, from Socotra we now have a type with a single carpellary whorl. We know so little of the flora of the adjacent Asiatic continent, and there are so many Socotran plants amongst those known therefrom, that it is not unlikely this plant may be found in that region. But, in any case, this plant having the facies so markedly of the pomegranate, differing indeed, except in fruit only in a few minor technical details, might, I think, be considered the type of the primitive stock whence *Punica granatum*, as it is known in cultivation, has sprung. A further point of considerable interest in the morphology of the carpels is the almost free condition of the ovary in the flower. In the pomegranate the ovary is inferior. This character, too, leads us back to an earlier stage in the evolution of the type.

Punica was first placed in the natural system by Jussieu in Myrtaceæ, and his lead has been followed by many botanists, including Lindley (*loc. cit.*), Meissner (Gen. 107), Endlicher (Gen. n. 6340), Berg (in Mart. Flor. Bras. xiv. 1. 514), Baillon (Hist. des Pl. vi. 330, 378), and Eichler (Blüthendiagr. ii. 488, some considering it deserving of a tribal distinction, others not conceding this. Again, Don (in Edin. New. Phil. Journ. 1826, 134) questioned Jussieu's allocation, remarking that the character of the fruit has been quite misunderstood (though his explanation which follows is indeed the most absurd of any that have been advanced), and proposed to make of it a new family, Granateæ, of which the affinities he states are uncertain. This family of Don has been kept up by De Candolle (Prod. iii. 3), Martius (Mat. Med. Bras. 50)

Wight (in an elaborate essay Illustr. ii. 2), Payer (*loc. cit.*), and Boissier (Flor. Orient. ii. 736).

Bentham and Hooker (Gen. Pl. i. 784) place it as an anomalous form in Lythrarieæ, and, so far as I know, they are the first authors who have done so.

In this account of the Botany of Socotra I have followed Bentham and Hooker, as a careful study of the whole question, in the light of our new Socotran plant, convinces me that their judgment is the correct one, and that *Punica* has its most natural position in Lythrarieæ. Those who would have the genus as a distinct family find but little support in morphology. The fruit-character, upon which stress was laid, is now proved by this Socotran plant to be what Lindley long ago pointed out was the case, and Berg, Eichler, and others more recently have maintained, merely a special development of a condition comparable with that in the several families with which the genus has undoubted alliance.

With Myrtaceæ there is undoubtedly a very near affinity. The general facies of the plant encouraged its union, and Lindley placed it in the vicinity of *Sonneratia*, which he also included in the order. Of technical characters the inferior ovary is a strong myrtaceous feature; but this character is disposed of by the discovery of our plant, and the differences separating *Punica* from Myrtaceæ are several and important, viz. :—the valvate calyx, plicate petals, nonstaminiferous disk, ovary not always inferior, pulpy seeds, and convolute cotyledons.

The character of the ovules is one in which the genus approaches Melastomaceæ in the tribe *Memecyleæ*, but the calyx and stamens are quite diagnostic.

With Lythrarieæ, in which it is here placed, it has a vast preponderance of features in common. The sepaline, petaline, and staminal characters which exclude it from Myrtaceæ and Melastomaceæ are just those of Lythrarieæ, the superior or half superior ovary of our Socotran plant is a thoroughly Lythrarioid character, and breaks down the chief objection urged by Eichler to Bentham and Hooker's allocation. In the pulpy seeds and convolute cotyledons it is still an exceptional type in Lythrarieæ, but *Sonneratia*, which is included by Bentham and Hooker in this order, shares with it the cotyledonary characters. So that the only aberrant condition of this genus, when placed in Lythrarieæ, is the pulpy seed coat, and I therefore consider Bentham and Hooker's recognition of its affinity as the correct one.

The discovery of our plant necessitates a recasting to some extent of the generic character, and this I now give :—

Calycis persistentis crasse coriacei tubus turbinatus, angulatus, ampliatus, liberus v. ovario adnatus; lobi 5–7. Petala 5–7, calycis fauci inserta, lanceolata v. obovata, corrugata. Stamina perplurima calycis fauci multiseriatim inserta, filamentis filiformibus incurvis; antheræ versatiles, ovatæ v. ellipticæ. Ovarium liberum sessile v. semi-inferum, v. inferum, multiloculare, loculis 5–7-seriatis fundo ovulifero v. plurmis 2- rarissime 3-seriatim

super-positis inferioribus axim versus, superioribus parietem versus, ovuliferis; stylus flexuosus v. rectus filiformis v. validus, stigmate spongioso; ovula placentis multiseriatim conferta. Bacca infera, sphærica, calycis limbo coronata, cortice crasse coriaceo, multiloculari, loculis nunc verticellatis nunc irregulariter superpositis ∞-spermis, septis tenuibus. Semina majuscula angulata, testa coriacea pulpa aquosa induta; cotyledones foliaceæ, spiraliter convolutæ, basi 2-auriculatæ; radicula brevissima.—Arbuscula ramosa ramulis teretiusculis sæpe spinescentibus. Folia opposita subopposita et in ramulos brevissimos fasciculata, oblonga v. obovata, obtusa, integerrima. Flores breviter pedicellati, axillares, solitarii v. subfasciculati, ampli, coccinei. Pedicelli validi bibracteolati.

Species 2, altera in oriente et in India boreali-occidentali indigena, late per regiones subtropicas culta, altera insulæ Socotræ incola.

P. protopunica, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 512. Tab. XXV.

Arbuscula 10-pedalis glabra. *Folia* petiolata elliptica v. oblonga v. obovata $1\frac{1}{4}$–$1\frac{1}{2}$ poll. longa $\frac{3}{4}$–1 poll. lata v. angustiora sæpe $\frac{1}{2}$ poll. lata nonnunquam fere orbicularia et 2 poll. diam. obtusa subemarginata coriacea; petiolus $\frac{1}{4}$ poll. longus. *Pedicelli* $\frac{1}{3}$–$\frac{1}{2}$ poll. longi; bracteolæ rotundatæ sub floribus late insertæ. *Calycis* lobi 5–7, $\frac{1}{4}$ poll. longi. *Petala* 5–7 obcordata v. obovata apice rotundata v. truncata emarginata basi acuta $\frac{5}{12}$ poll. longa $\frac{1}{4}$ poll. lata. *Antheræ* ellipticæ. *Ovarium* superum v. seminiferum 5–7-loculare, loculis 1 seriatis; stylus rectus validus basi paullum incrassatus; ovula cujusque loculi fundum dense vestentia. *Bacca* 5–7-locularis 1 poll. diam. glabra nitida rubescens superne calycis limbo coronata apiceque umbilicata. *Semina* loculorum fundum lateraque obtegentia.

Nom Vern. Rehina (B.C.S.). Rehane (Schweinf.).

Socotra. A common tree on the higher parts of the Haghier range. B.C.S. nn. 263, 505. Schweinf. n. 506. Hunter.

Distrib. Endemic.

This is a very distinct and interesting species. Its phylogenetic and morphological importance has been referred to above, under the genus, and in the Appendix will be found an extended account of its morphologically interesting features.

A small tree, it grows in abundance over the plateaux sloping southwards from the Haghier peaks. In general habit it is not unlike the pomegranate, but its leaves are larger and coarser, and it wants the delicate character of the foliage of that species. The flowers, too, are somewhat smaller, and their turbinate base is more angular. The fruit is very much less in size.

We may, I think, with much probability, expect that this species will be found on the adjacent mainland of Asia.

Order XXIX. ONAGRARIEÆ.

A considerable order, chiefly of temperate regions of the globe, more rarely found in the tropics.

LUDWIGIA.

Ludwigia, Linn. Gen. n. 153; Benth. et Hook. Gen. Pl. i. 788.

A genus containing chiefly North American species, but a few are widely spread in the old world.

L. palustris, Ell. Bot. Car. Georg. i. 211; Boiss. Flor. Orient. ii. 752; Syme Eng. Bot. t. 510.

Socotra. Common. B.C.S. n. 346. Schweinf. n. 636.

DISTRIB. Europe, Cape of Good Hope, and North America.

Order XXX. CUCURBITACEÆ.*

A large order, chiefly of tropical regions, of the whole world. All twiners except our Socotran plant. There are representatives of six genera in Socotra. One of these is endemic, one is tritypic with a species in Angola, one in central Africa, and one in Socotra; a third is a Mediterranean, south-west Asiatic, and tropical African genus, whilst the three remaining are widely spread tropical or sub-tropical genera.

1. EUREIANDRA.

Eureiandra, Hook. fil. in Benth. et Hook. Gen. Pl. i. 825.

A tritypic genus, one species being found in Angola, one in central Africa, and the other in Socotra.

E. Balfourii, Cogn. in Proc. Roy. Soc. Edin. xiii. (1883). Tab. XVII, B.

Caule glabro; petiolo brevissime sparseque puberulo demum glabro; foliis utrinque breviter sparseque aspersis demum albo-callosis plerumque leviter 3–5-lobatis, lobis sæpius triangularibus apice subacutis; floribus pro genere parvis, masculis brevissime racemosis subfasciculatis; calycis tubo late infundibuliformi subcampanulato, staminum filamentis glabris; ovario oblongo; fructu ovoideo-subfusiformi, apice longiuscule acuteque rostrato.

Caulis gracilis angulato-sulcatus levis cinereus. *Petiolus* satis gracilis striatus levis vel demum interdum leviter rugosus $\frac{4}{5}$–$2\frac{1}{4}$ poll. longus. *Folia* tenuiter membranacea ambitu ovata supra læte viridia subtus paulo pallidiora 3–6 poll. longa et fere totidem lata rarius fere usque ad medium lobata, lobis margine undulato-crenulatis mucronulatisque, mediano paulo longiore ad basim non constricto; sinus basilaris subrectangularis $\frac{3}{5}$–$1\frac{1}{5}$ poll. profundus latusque. *Cirrhi* graciles elongati teretes glabri. *Pedunculus* communis masculus gracilis sulcatus leviter puberulus multiflorus $\frac{1}{5}$–$1\frac{1}{5}$ poll. longus; pedicelli filiformes recti puberuli $\frac{3}{5}$–$\frac{4}{5}$ poll. longi. *Calycis* tubus puberulus longitudinaliter tenuissime nervosus superne satis dilatatus inferne longiuscule attenuatus $\frac{1}{5}$–$\frac{1}{4}$ poll longus et apice totidem latus; segmenta linearia $\frac{1}{4}$–$\frac{3}{10}$ poll. longa $\frac{1}{12}$ poll. lata. *Corolla* subglabra, segmentis ovato-oblongis acutis 3–5-nerviis margine brevissime ciliatis $\frac{3}{5}$ poll. longis. *Staminum* filamenta ad basim non dilatata $\frac{1}{10}$–$\frac{1}{8}$ poll. longa; antheræ biloculares apice

* I am indebted to M. Cogniaux for the determination of some of the difficult forms and fragmentary specimens in our collection.

leviter lobatæ $\frac{1}{6}$ poll. longæ $\frac{1}{8}$ poll. latæ. *Flores* feminei solitarii vel rarius geminati. *Staminodia* lanceolata puberula $\frac{1}{10}$ poll. longa. *Stylus* subfiliformis $\frac{1}{5}$ poll. longus *Pedunculus* fructiferus satis gracilis leviter flexuosus $\frac{2}{5}$–2 poll. longus. *Fructus* glaber leviter verrucosus inferne leviter attenuatus obtususque 2 poll. longus $\frac{4}{5}$ poll crassus. *Semina* (immatura) ovoidea leviter compressa distincte marginata utrinque levia basi minute bidenticulata $\frac{3}{10}$ poll. longa $\frac{1}{6}$–$\frac{1}{5}$ poll. lata.

Nom. Vern. Dachshana or Dichshani (Schweinf.).

Socotra. A species spread over the island. B.C.S. n. 281. Schweinf. nn. 502, 541, 640, 647.

Distrib. Endemic.

This dicecious plant M. Cogniaux has kindly determined and described for me. The female plant we did not obtain, but Schweinfurth sends two specimens of it (nn. 541, 747), and it is to this form the native name as given by him is applied. He labels them as probably *Coccinea*, upon which Cogniaux remarks—" Cette plante a assez le porte d'un *Coccinea* ; mais elle paraît bien le pied femelle des nn. 502 et 640, qui ne peuvent se rapporter à ce genre, car ils ont les fleurs mâles à étamines entièrement libres et insérées au milieu du tube du calice, tandis que les *Coccinia* ont les étamines insérées au fond du tube au centre de la fleur, et les filets soudés en colonne." Our specimens have no flowers.

An interesting find, in view of the distribution of the genus, which has but two other representatives, as yet known from limited areas in tropical Africa.

2. MOMORDICA.

Momordica, Linn. Gen. n. 1090 ; Benth. et Hook. Gen. Pl. i. 825.

A genus attaining its maximum of development in Africa, but a few species are dispersed over tropical and sub-tropical regions of both old and new worlds. One of the Socotran species is an old world one, now introduced in America, the other is cosmopolitan in the tropics.

1. **M. Balsamina**, Linn. Sp. 1433 ; Ser. in DC. Prod. iii. 311 ; Hooker in Oliv. Flor. Trop. Afr. ii. 537 ; Boiss. Flor. Orient. ii. 757 ; Clarke in Hook. Flor. Trop. Ind. ii. 617 ; Cogn. in DC. Monog. Phanerog. iii. 439 ; Lamk. Illustr. t. 794, f. 1.

Socotra. Near Tamarida. B.C.S. n. 698.

Distrib. Africa, Asia, and Australia ; also America where it is introduced.

2. **M. Charantia**, Linn. Sp. 1433 ; Ser. in DC. Prod. iii. 311 ; Hook. fil. in Oliv. Flor. Trop. Afr. ii. 537 ; Clarke in Hook. Flor. Brit. Ind. ii. 616 ; Cogn. in DC. Monog. Phanerog. iii. 436,

var. **abbreviata**, Ser. in DC. Prod. iii. 311 ; Cogn. in DC. Monog. Phanerog. 437.

Socotra. Near Galonsir. B.C.S n. 162.

Distrib. Of both the species and variety,—through the tropics generally.

3. CUCUMIS.

Cucumis, Linn. Gen. n. 1092 ; Benth. et Hook. Gen. Pl. i. 826.

A genus of the tropical and sub-tropical regions of the globe. The three Socotran species are all of south-west Asiatic and tropical African distribution.

1. **C. ficifolius**, Ach. Rich. Tent. Flor. Abyss. i. 294, t. 53 bis ; Cogn. in DC. Monog. Phanerog. iii. 493 ; Franch. Sert. Somal. in Miss. Révoil 32.

C. Figarei, Delile Cat. Hort. Monsp. ex Naud. in Ann. Sc. Nat. sér. 4, xi. (1859), 16 ; Hook. fil. in Oliv. Flor. Trop. Afr. ii. 543 ;

var. **echinophorus**, Naud. in Ann. Sc. Nat. sér. 4, xi. (1859), 16 ; Cogn. *loc. cit.* 494.

Socotra. Not uncommon. B.C.S. nn. 52, 169. Schweinf. nn. 359, 746.

Distrib. Arabia and tropical Africa.

2. **C. prophetarum**, Linn. Sp. 1436 ; DC. Prod. iii. 301 ; Hook. fil. in Oliv. Flor. Trop. Afr. ii. 545 ; Boiss. Flor. Orient. ii. 758 ; Clarke in Hook. Flor. Brit. Ind. ii. 619 ; Cogn. in DC. Monog. Phanerog. iii. 495.

Socotra. Not uncommon. B.C.S. n. 682.

Distrib. Tropical Africa, and through Arabia and Persia to India.

3. **C. dipsaceus**, Ehrenb. in Spach Vég. Phan. vi. 211 ; Hook. fil. in Oliv. Flor. Trop. Afr. ii. 543 ; Cogn. in DC. Monog. Phanerog. iii. 500 ; Rev. Hortic. 1860, 209, c. ic. xyl.

Nom. Vern. Thana (Schweinf.).

Socotra. At Tamarida. Schweinf. n. 435.

Distrib. Arabia and tropical Africa.

4. CITRULLUS.

Citrullus, Schrad. in Eckl. et Zeyh. Enum. 279 ; Benth. et Hook. Gen. Pl. i. 826.

A genus of two species inhabiting the Mediterranean region, west Asia, and tropical Africa.

C. Colocynthis, Schrad. in Linnæa xii. (1838), 414 ; Hook. fil. in Oliv. Flor. Trop. Afr. ii. 548 ; Boiss. Flor. Orient. ii. 759 ; Clarke in Hook. Flor. Brit. Ind. ii. 620 ; Cogn. in DC. Monog. Phanerog. iii. 510 ; Wight Ic. t. 498.

Socotra. Occasional about villages. B.C.S. n. 36. Boivin n. 1061.

Distrib. In the Mediterranean region, tropical Africa, and western Asia.

5. MELOTHRIA.

Melothria, Linn. Gen. n. 50; Benth. et Hook. Gen. Pl. i. 830.

A considerable genus of the warmer regions of the globe, but most abundant in Africa.

? **M. punctata**, Cogn. in DC. Monog. Phanerog. iii. 615.

Zehneria scabra, Sond. in Harv. and Sond. Flor. Cap. ii. 486; Hook. fil. in Oliv. Flor. Trop. Afr. ii. 560.

Socotra. Near Tamarida. B.C.S. n. 353.

Distrib. South Africa, Indian Ocean islands, Abyssinia, and East Indies.

A very poor specimen is doubtfully referred to this species by Cogniaux.

6. DENDROSICYOS.

Dendrosicyos, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 513.

Flores monoici. Fl. ♂ fasciculati. Calycis tubus infundibuliformis, dentibus 5 patentibus lanceolatis integris. Corolla fauci calycis inserta ad basin 5-partita, segmentis lineari-lanceolatis integris. Stamina 3 ori calycis inserta, corollæ adnata, filamentis liberis; antheræ arcte cohærentes, una 1-locularis, ceteræ 2-loculares, loculis rectis, connectivo nonproducto. Ovarii rudimentum 0. Fl. ♀ . . .—Arbor parvus trunco magno atque ramis paucis ad apicem fasciculatis. Folia palmatim 5-lobata v. partita, aculeata, scabrida. Cirrhi 0. Flores ♂ magni, straminei.

A very remarkable genus. Unfortunately I am not able to give a complete diagnosis. We brought to this country plenty of specimens, but they have been mislaid, and I am dependent therefore for my description upon some male flowers preserved in alcohol, and a fragmentary leafing specimen sent by Schweinfurth. Should our specimens be discovered, it may be possible in the Appendix to say something more regarding the character of the plant.

Here I may state that by the habit of the tree, which shows a soft rapidly-tapering gouty stem, this genus is distinguished from all other Cucurbits, and forms a most exceptional one in the family. Its alliances I am, in the absence of female flowers, unable to determine.

D. socotrana, Balf. fil. *loc. cit.* Tab. XXVI.

Arbor podagrica trunco crasso succulento sæpe 3 ped. diam. albido corticali. *Rami* subpendentes tenues plus minusve aculeato-scabridi rugosi, juveniles dense papilloso-aculeati. *Folia* sparsa 3 poll. diam. v. majora petiolata rotundato-cordata plus minusve 5-lobata palmatinervia margine dentata aculeata scabrido-papillosa, juvenilia palmatisecta lobis aculeatis scabridis et setis albidis nitidis vestita. *Flores* in fasciculos axillares breviter pedunculatos conferti, fœminei pauci centrales terminales, masculi plures externi basales; pedicelli pubescentes striati $\frac{1}{3}$–$\frac{1}{2}$ poll. longi; bracteolæ lanceolatæ pubescentes $\frac{1}{6}$ poll. longæ. Fl. ♂:—*Calycis* tubus $\frac{3}{4}$–1 poll. longus, lobis acutis $\frac{1}{5}$ poll. longis scabridis. *Petala* acuta extus scabrida $\frac{1}{2}$ poll. longa. *Staminum* filamenta glabra $\frac{1}{5}$ poll. longa perfectorum latiora apiceque bifida; antheræ oblongæ $\frac{1}{5}$ poll. longæ. Fl. ♀:—Fructus glanduloso-hirsutus.

Nom Vern. Gamha or Gamhen (Schweinf.). Camhane (Wellst.).

Socotra. A tree found in many parts of the island. B.C.S. n. 210. Schweinf. n. 243.

DISTRIB. Endemic.

ETYM. Δένδρον, tree and σικυὸς, cucumber.

Schweinfurth had this growing at Cairo, but he tells me it did not thrive. The examination of the anatomy of the stem would be of great morphological interest, and I hope to have some specimens from Schweinfurth's plant, of which an account will be given in the Appendix.

The tree never attains any great height, but its soft, bare, and stout stems, surmounted by a tuft of few slightly pendant branches, give it a weird and fantastic look possessed by only one or two other plants on the island, *e.g.*, the *Adenium multiflorum*, Klotzsch, and the *Dorstenia gigas*, Schweinf. Writing of this tree, Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 198) says :—"The most singular among the trees are two varieties which are called, in the language of the island, Assett and Camhane; both grow in very rocky places, and derive nourishment from the soil lodged in cells and cavities. The whole diameter of their trunks consists of a soft, whitish cellular substance, so easily cut through that we could divide the largest of them with a common knife. Camels and sheep feed on the leaves of the Camhane, but reject those of the Assett. A milk-white juice exudes from the trunk and leaves of both, the nature of which is so acrid, that if it penetrates to the eyes the pain is almost intolerable. Several stems branch forth from the same family of roots, and the Assett trees mostly divide, at a short distance from the ground, into several branches. From the relative proportion between their height and diameter, and the few leaves of foliage borne by them compared to their bulk, the most singular and grotesque appearances are often produced; some are not more than five feet in height, while their base covers a greater extent in diameter. Both varieties, during the north-east monsoon, bear a beautiful red flower. Since leaving Socotra, I have met the same trees in the vicinity of Maculla, but I can find no mention made of them in any work within my reach." And again (page 141), he says that near Kadhab he saw "inscribed on the soft and yielding bark of a Camhane tree some Arabic inscriptions dated as far back as 1640."

The Assett tree mentioned by Wellsted is, I doubt not, the *Adenium multiflorum*, Klotzsch (*q.v.*). I do not understand Wellsted's remark that the flowers of the Camhane are red. All we obtained were yellow. One of the mountain tribes of Socotra, according to Wellsted and Captain Hunter, bears the name of this tree—"Camahane." This tribe, which lives "in Haghier and the hills above the Hadibu plain, claims to have its origin from the intermarriage of the aborigines with the Mahri Arabs from the opposite coast."

Amongst the few plants from the Arabian coast known to botanists, the Camhane does not occur. It may, as Wellsted states, grow on that coast, but in absence of confirmatory evidence, I here regard the plant as endemic.

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Order XXXI. BEGONIACEÆ.

A family of only two genera, but many species, widely spread through the tropics of both old and new worlds.

BEGONIA.

Begonia, Linn. Gen. n. 1156; Benth. et Hook. Gen. Pl. i. 841.

A vast genus, with the distribution of the order.

B. socotrana, Hook. fil. in Gard. Chron. xv. n. s. (1881), 8, c. ic. xyl., and Bot. Mag. t. 6555.

Erecta sparse patentim hirsuta; foliis peltatis orbicularibus disco intruso infundibuliformi, marginibus recurvis crenatis; floribus monoicis roseis; fl. masculis numerosis perianthii segmentis 4 obovatis, staminibus in globum confertis, filamentis brevibus liberis, antheris clavatis recurvis apice rotundatis postice dehiscentibus; fl. fœmineis solitariis perianthii segmentis 6 elliptico-obovatis oblongis obtusis, stylis brevibus ramis patenti-incurvis non tortis, stigmatibus cordatis v. hippocrepibus linea papillosa conjunctis, ovario 2-gono 3-loculari loculis alatis sed ala dorsali maxima, placentis integris.

Bulbifera. *Caulis* validus et succulentus pauciramosa circa pedalis. *Folia* 4–7 poll. diam. longe petiolata, petiolo 6–9 poll. longo. *Stipulæ* subrotundatæ deciduæ. *Flores* in cymas (1–2 fœminei cum masculis plurimis in quaque cyma) laxas oppositifolias pauciramosas folia excedentes dispositi, pedicellis ultimis $\frac{3}{4}$ poll. longis; bracteis late ovatis v. subrotundatis. *Fl.* ♂ sæpe $1\frac{1}{2}$ poll. diam. *Fl.* ♀ masculis minores. *Fructus* $\frac{1}{2}$ poll. longus alis membranaceis glabris. *Semina* foveolata.

Nom. Vern. Saiberbher (B.C.S.).

Socotra. On the Haghier hills under the shade of boulders. B.C.S. n. 419. Schweinf. in lit.

Distrib. Endemic.

This curious species is a plant of the higher regions of the granitoid Haghier hills, and is very striking on account of its orbicular leaves. We were fortunate to bring home bulblets in a living condition, and from those planted in April 1880, several plants were raised in the Royal Gardens, Kew, and they flowered in December of the same year. From these plants Sir Joseph Hooker described the species. Writing of it from a horticultural point of view, Sir Joseph Hooker remarks that it flowers "at a season when such a plant is doubly welcome to the cultivator, as similar Begonias of the Andes, which make so magnificent a show in the conservatory during the summer and autumn months, are then all long past flowering. It is easily propagated by its bulblets, and as the Kew plants continued in flower for two months in a warm conservatory, it will doubtless prove a great favourite.". The stock has been acquired by Messrs Veitch and Sons, of Chelsea, and the plant, which has obtained a first-class certificate from the Royal Horticultural Society, has been introduced to the public.

As to its affinities I may again quote Sir Joseph Hooker:—"From the geographical position of the island the affinity of this discovery may be con-

jectured to be either Asiatic or African, and upon the whole, though referable to none of the sixty sections of the genus founded by Klotzsch and De Candolle, it must, I think, be placed in the African one of *Augustia*, from the character of which it differs chiefly in the male perianth having four segments, in the shorter filaments, rounded top of the anther, in the six lobes of the female perianth (instead of five), and the intwisted arms of the style—characters all of which, except the last, occur in the Natal *B. geranioides*, Hook. fil. (Mag. t. 5583), to which *B. socotrana* is unquestionably closely allied."

This plant is remarkable in the genus as being bulbiferous, and from the bulbs is easily propagated. These are quite different from the tubers of the well-known tuberous Begonias, and for an account of their structure see Appendix.

Order XXXII. FICOIDEÆ.

A considerable tropical order. Of the five genera represented in Socotra, two are found all over the world in the tropics, two have a more limited old world distribution, and the fifth is a genus of sub-tropical regions and shore districts, attaining a maximum in south Africa.

1. TETRAGONIA.

Tetragonia, Linn. Gen. n. 627; Benth. et Hook. Gen. Pl. i. 854.

A small genus, with a general range over the sub-tropical regions of the world, but attaining a maximum in south Africa. Only one species is known from tropical Africa, and there are none from the adjacent Asiatic coasts.

T. pentandra, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Herba glabra ramis longe patentibus; foliis deltoideo-ovatis remotis; floribus binis axillaribus; staminibus quot tot calycis lobis; nucumento pentagono obconoideo.

Herbacea prostrata a collo ramosa, ramis tenuibus late patentibus sparse versus extremitates ramentaceis. *Folia* remota longe petiolata 1¼–1½ poll. longa ½–⅔ poll. lata v. majora ovata v. deltoideo-ovata obtusa basi abrupte contracta in petiolum ⅓–½ poll. longum membranacea viridia. *Flores* minuti bini in axillis subsessiles. *Calycis* lobi æquales 5 oblongi obtusi subincurvi glabri margine membranacei. *Stamina* 5 filamentis subulatis; antheræ ellipticæ. *Styli* 3 calyci æquilongi. *Fructus* obconoideus truncatus pentagonus apice convexus ½ poll. longus 1-locularis 1-spermus, pericarpio coriaceo glabro. *Semen* nitidum testa foveolata.

Socotra. Near Galonsir. B.C.S. n. 37.

Distrib. Endemic.

Quite a distinct species of this genus, being distinguished from the majority of species by the small number of stamens, and from all by its small, obconoid, smooth, almost sessile fruits. With the south African *T. microptera*, Fenzl. (ex Harv. and Sond. Flor. Cap. ii. 455), and *T. echinata*, Ait. (Hort. Kew. ii. 177), it has probably nearest affinity, but the fruits are quite diagnostic.

2. AIZOON.

Aizoon, Linn. Gen. n. 629; Benth. et Hook. Gen. Pl. i. 854.

A small old world genus of species mostly African, but occurring also in south Europe and western Asia. One is Australian.

A. canariense, Linn. Sp. 700; DC. Prod. iii. 453; Oliv. Flor. Trop. Afr. ii. 584; Boiss. Flor. Orient. ii. 765; Clarke in Hook. Flor. Brit. Ind. ii. 659.

Socotra. Common on the plains. B.C.S. n. 56. Schweinf. n. 349.

DISTRIB. From the Canary Islands, through tropical Africa and Arabia, to Scindh. Also at the Cape of Good Hope.

3. TRIANTHEMA.

Trianthema, Linn. Gen. n. 537; Benth. et Hook. Gen. Pl. i. 855.

A small genus of tropical and subtropical regions, chiefly of the old world, but occurring also in the West Indies.

T. pentandra, Linn. Mant. 70; DC. Prod. iii. 352; Oliv. Flor. Trop. Afr. ii. 588; Boiss. Flor. Orient. ii. 766; Clarke in Hook. Flor. Brit. Ind. ii. 660.

Socotra. Near Tamarida. B.C.S. n. 63. Schweinf. n. 367.

DISTRIB. Tropical Africa, Persia, and north-west India.

4. ORYGIA.

Orygia, Forsk. Flor. Ægypt. Arab. 103; Benth. et Hook. Gen. Pl. i. 856.

Monotypic, the species being widely spread in warmer Africa (north and south), Arabia, Scindh, and India.

O. decumbens, Forsk. Flor. Ægypt. Arab. 103; DC. Prod. iii. 455; Boiss. Flor. Orient. i. 755; Oliv. Flor. Trop. Afr. ii. 589; Clarke in Hook. Flor. Brit. Ind. ii. 661.

Orygia mucronata, Klotzsch in Peters' Mossamb. 140, t. 25.

Socotra. Common on the plains of Galonsir, Hadibu, and elsewhere. B.C.S. n. 297. Schweinf. n. 521.

DISTRIB. Pretty widely spread in tropical Africa, the Cape of Good Hope, in Beloochistan, Scindh, and India.

5. MOLLUGO.

Mollugo, Linn. Gen. n. 106; Benth. et Hook. Gen. Pl. i. 857.

A small genus common in the warmer regions of both the old and new worlds.

M. hirta, Thunb. Flor. Cap. 120; DC. Prod. i. 391; Clarke in Hook. Flor. Brit. Ind. ii. 662.

M. Glinus, Ach. Rich. Tent. Flor. Abyss. i. 48; Oliv. Flor. Trop. Afr. ii. 590.

Glinus lotoides, Linn. Sp. 663; Sibth. Flor. Græc. t. 472; Boiss. Flor. Orient. i. 755.

Socotra. Near Galonsir. B.C.S. n. 713.

Distrib. Common in all warmer regions of the globe.

Order XXXIII. UMBELLIFERÆ.

A very large order, most numerously represented in the temperate and cooler regions of the northern hemisphere. Five genera are found in Socotra. One of these is endemic, and the others are genera of considerable range in both old and new worlds, or in the old world alone.

1. HYDROCOTYLE.

Hydrocotyle, Linn. Gen. n. 325; Benth. et Hook. Gen. Pl. i. 872.

A large genus dispersed over the warmer and temperate regions of the globe.

H. asiatica, Linn. Sp. 338; Hiern in Oliv. Flor. Trop. Afr. iii. 6; Clarke in Hook. Flor. Brit. Ind. ii. 669; Wight Ic. t. 565.

Socotra. On the banks of many streams. B.C.S. n. 390. Schweinf. n. 590.

Distrib. Tropical and subtropical districts.

2. NIRARATHAMNOS.

Nirarathamnos, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 513.

Calycis dentes minuti, acuti. Petala lata acumine longo bifido induplicato, ob costam impressam emarginata. Discus margine subcrenato cum stylopodiis conicis confluens; styli breves. Fructus ovoideus, utrinque ad commissuram angustam constrictus; carpella 5-gona; juga primaria prominula, subæqualia, exalata; vittæ ad valleculas solitariæ. Carpophorum bipartitum. Semen semiteres, ad vittas sulcatum, facie leviter concavum.—Suffrutex lignosus, rigidus, glaberrimus, aromaticus. Folia rotundata, margine revoluta, crenata, reticulato-venosa. Umbellæ compositæ pauci-radiatæ. Involucri et involucellorum bracteæ subfoliaceæ persistentes radiantes. Flores albo-virentes, pedicellati.

A new monotypic genus, nearly allied to the naturally limited *Bupleurum*. Indeed the plant appears almost a member of that genus. But the form of its petals, the conical and not flattened stylopod, and the non-compressed fruit separate it sufficiently. The shrubby habit it presents is not common in *Bupleurum*, although it is occasionally seen.

The name is derived from the hero of a legend connected with the spot where we discovered the plant. This is near the summit of the Sicante ridge of the Haghier range, in a gorge at an altitude of nearly 4000 feet. Spanning the chasm is a large granite boulder, regarding which the following legend, which I quote from an account of the island given by Captain Hunter in the *Bombay Gazette* for May 1876, is related:—"On the lofty granite peaks, in former times, there dwelt a man Nisara, with his wife Nowseoo. They were of gigantic stature, and each ate half an ox at every meal. They had a son

named Nirara, in order to make a swing for whom his mother broke off a piece of the granite cliff, and cast it across a chasm between two peaks. From this lofty bridge she hung her infant's swing cradle."

N. asarifolius, Balf. fil. *loc. cit.* Tab. VII, A.

Suffrutex parvus caulibus tortuosis foliorum demissorum baseis incrassatis tuberculatis. *Folia* 1¾ poll. longa radiatim venulosa supra glabra nitentia subtus glanduloso-punctulata; petiolus ¼–½ poll. longus basi incrassatus sublignosus. *Bracteæ* ovatæ. *Pedicelli* ⅛ poll. longi. *Fructus* ¼ poll. longus ⅛ poll. latus.

Nom Vern. Dbehoma (B.C.S.).

Socotra. Near the summit of Sicante, north from Tamarida, at 4000 feet elevation. B.C.S. n. 440.

Distrib. Endemic.

A sweetly aromatic plant, exhibiting a strong tendency to form tricarpellary fruits.

3. CARUM.

Carum, Linn. Gen. n. 365; Benth. et Hook. Gen. Pl. i. 890.

A considerable genus, chiefly found in temperate and subtropical regions of the old world, but some species occur in America. Both Socotran species are endemic, and belong to a section of the genus spread through the Mediterranean region, Central Asia, India, and South Africa.

1. **C.** (Trachyspermum) **pimpinelloides**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 514.

Glabrescens diffusum; foliis petiolatis tripartitis, segmentis in lacinias lanceolatas acutas 1–2-trifidis; umbellis breviter pedunculatis oppositifoliis 5–8-radiatis; bracteis 5–7; pedicellis 5–7 validis; fructu oblongo v. suborbiculari, jugis prominulis glabris v. hispidis, commissura multo constricta.

Herba pusilla vix ½ ped. alta diffusa a basi ramosissima caulibus parum striatis primum sparsim puberulis demum glabris. *Folia* inferiora longe petiolata 1 poll. longa in segmenta trifida v. bifida ⅓ poll. longa tripartita v. bitripartita, superiora minora tripartita segmentis trifidis laciniis lanceolatis acutis, glabrescentia; petiolus basi expansus amplexicaulis vagina ciliata. *Umbellæ* terminales oppositifoliæ (pedunculis 1¼ poll. longis) 5–8-radiatæ radiis brevibus vix ⅛ poll. longis; bracteæ involucri angustæ lineari-lanceolatæ 5–7 persistentes herbaceæ puberulo-ciliatæ radiis æquilongæ; pedicelli angulati validi 5–8 in fructu breves vix fructui æquilongi; bracteolæ pedicellis multo breviores. *Petala* ciliata acumine bifido staminibus breviora. *Fructus* oblongus et glaber v. elliptico-orbicularis cum jugis prominulis undulatis hispidis, vittis solitariis, commissura angusta valde constricta, stylis deflexis longis, stylopodio conico.

Socotra. On the shore between Kadhab and Galonsir. B.C.S. nn. 367, 459, 564.

Distrib. Endemic.

A species having a near alliance with *C. dichotomum*, Benth. and Hook. (Gen. Pl. i. 891), a plant of Morocco, which differs, however, in its pinnatisect leaves, its umbels, and its fruit.

Our plant we gathered only in one locality, and our specimens show considerable variation. In some the fruit is quite glabrous and the ridges are prominent, somewhat undulate and rough. An examination of these under a sufficient magnifying power shows that they are covered with a number of irregular projections like undeveloped hairs.

In another set of specimens (n. 459) these processes have developed into short firm hairs, curved at the apex, and the whole fruit is thus somewhat hispid.

A third series (n. 564) shows the hispid character of the fruitvery clearly, and even in the ovary in a very young condition this feature is exhibited. Along with this character is associated a tendency in the lower leaves to be cut into longer and more linear segments; the upper leaves are occasionally linear and undivided, and the primary rays of the umbels are elongated and exceed in length the bracts. In all of these characters there is an approach to the next species we describe from the island—*C. calcicolum*, Balf. fil.

2. C. (Trachyspermum) **calcicolum**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 514.

Glabrescens nudum erectum, caulibus angulosis; foliis basalibus longe petiolatis in lacinias longas lineares tripartitis v. bitripartitis, superioribus filiformibus sessilibus; umbellis longe pedunculatis oppositifoliis 2–4-radiatis, radiis bracteis 2–4 multo longioribus, pedicellis 8–12 tenuibus; fructu ovoideo, jugis nonprominulis hispidis, commissura non multo constricta.

Herba gracilis erecta 9 poll. alta dichotome ramosa depauperata. *Caules* primum puberuli demum glabrescentes internodiis elongatis. *Folia* pauca, radicalia circa 2 poll. longa longe petiolata in lacinias ½ poll. longas angustas lineares acutas integras tripartita v. bitripartita glabra, superiora sæpe filiformia basi dilatata amplexicaulia. *Umbellæ* oppositifoliæ pedunculis 1¼–2 poll. longis sparsim puberulis; radii primarii 2–4 in fructu capillares ½ poll. longi striati bracteis 2–4 lineari-filiformibus herbaceis puberulo-ciliatis triplo-longiores, secundarii 8–12 in fructu ⅛ poll. longi bracteolis breviores. *Petala* ciliata acumine integro acuto. *Fructus* dense hispidus jugis non prominulis, valleculis univittatis, commissura constricta sed non angustata; stylis deflexis, stylopodio conico.

Socotra. Very common on the limestone plains near the sea. B.C.S. nn. 190, 357.

Distrib. Endemic.

A very slender annual, greatly depauperate, which differs from the type of the last species in habit, in its angular and purple stems, its few linearly cut leaves, the few primary branches of the umbels much longer than the bracts, and in its densely hispid fruit without a much narrowed commissure.

As I have mentioned, under the last species there are forms of it which

approach this species in many characters. And we have likewise a specimen (n. 190), undoubtedly of this species, which by its somewhat contracted and stouter habit affords a step towards the foregoing. It may be that these are forms of one species, but as there is no complete transition, I have kept them distinct.

4. FŒNICULUM.

Fœniculum, Adans. Fam. Pl. ii. 101; All. Flor. Pedem. ii. 25; Benth. et Hook. Gen. Pl. i. 902.

A small genus, including species in cultivation all over the world.

F. vulgare, Gärtn. Fruct. i. 105, t. 23, f. 5; Clarke in Hook. Flor. Brit. Ind. ii. 695; Wight Ic. t. 515.

F. officinale, All. Flor. Ped. ii. 25; Boiss. Flor. Orient. ii. 975.

Nom Vern. Kömmor (B.C.S.).

Socotra. Cultivated at Galonsir. B.C.S. n. 456.

Distrib. Cultivated widely.

5. PEUCEDANUM.

Peucedanum, Linn. Gen. n. 339; Benth. et Hook. Gen. Pl. i. 918.

A vast genus, chiefly spread in the northern hemisphere of both worlds, but also found in South America and South Africa.

P. cordatum, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 544.

Annuum glabrum erectum; foliis bipinnatisectis, segmentis latis planis plerumque sessilibus palmatim trifidis, laciniis acute dentatis v. subincisis membranaceis; umbellis primariis 10–20-, secundariis 8–12-radiatis; fructu pedicello breviore elliptico basi alte-cordato, vittis vallecularibus solitariis, commissuralibus binis approximatis, alis fructui æquilatis.

Herba annua erecta circa 2-pedalis, radice fusiformi caule pallido tereti striato vix ramoso. *Folia* longe petiolata basi dilatata amplexicaulia, radicalia fere pedalia, caulina 4 poll. longa, pinnatisecta 3-juga, pinnis infimis pinnatisectis petiolulatis, supremis subsessilibus et incisis segmentis planis latis magnitudine variantibus nunc 2 poll. nunc $\frac{3}{4}$ poll. diam. lateralibus palmatim trifidis terminalibus sæpe purpureis, laciniis acute dentatis v. subincisis basi subcordatis v. subcuneatis v. horizontaliter expansis inæqualibus glabris subpunctulatis membranaceis margine subtiliter revolutis. *Umbellarum* rhachis 3–5 poll. longa rarius sub umbellis ramosa; umbellæ primariæ 10–20-radiatæ radiis in fructu 1–1$\frac{3}{4}$ poll. longis, secundariæ 8–12-radiatæ radiis $\frac{1}{3}$–$\frac{1}{2}$ poll. longis. *Involucra* et involucella circa 8-phylla phyllariis herbaceis subulatis obtusis. *Flores* ignoti. *Fructus* $\frac{1}{4}$ poll. longi pedicellis breviores elliptici basi cordati ad faciem commissuralem albido-furfuracei glabri, alis subæquilatis, jugis prominulis, vittis valleculæ angustis solitariis, commissuræ binis latis approximatis.

Socotra. Common on the hills. B.C.S. n. 290. Schweinf. n. 572.

Distrib. Endemic.

A broad-leaved species, easily distinguished from others in the genus by the manner of cutting of the leaves, and especially by the cordately based fruits.

GAMOPETALÆ.

Order XXXIV. RUBIACEÆ.

A vast natural order, represented in Socotra by nine genera. One of these is endemic, and one is a small genus of a limited range in Madagascar and east tropical Africa; four are spread over the warmer regions of the world, one of them having a maximum in temperate regions; and three are old world genera, two of which are however restricted to the Mediterranean region and Western Asia.

1. DIRICHLETIA.

Dirichletia, Klotzsch in Monatsb. Akad. Wiss. Berol. 1853, 494, and in Peters' Mossamb. Bot. tt. 47, 48; Benth. et Hook. Gen. Pl. ii. 56.

A small genus, consisting now of seven species, inhabiting east tropical Africa, Madagascar, and Socotra. Four species are found in Socotra, no less than three being endemic, and the fourth is a Somali Land plant.

The development of this genus in Socotra is exceedingly interesting, and the discovery of our specimens enables us to complete the generic description in Bentham and Hooker's Genera Plantarum, and also necessitates slight emendation of the generic characters. In the only species of which we have flowers these are dimorphic, and possibly this is characteristic of the whole genus. The calyx limb is dilated into a wing, sometimes 5-lobed; the lobes of the corolla and the stamens are often five. The disk is often quite glabrous, and the style is often-four cleft. The testa is very tough and the albumen may be fleshy. The following, then, is the amended generic character:—

Calycis tubus parvus, obconicus; limbus in laminam amplissimam reticulatum concavam obliquam late unilabiatam v. 4–5-lobatam excrescens, membranaceus, persistens. Corolla infundibularis v. tubulosa, tubo gracili elongato fauceque intus glabro v. piloso; limbi lobi 4–5, breves, triangulares, reduplicatim valvati. Stamina 4–5, infra faucem corollæ inserta, filamentis filiformibus; antheræ inclusæ, dorso affixæ, lineari-oblongæ, utrinque obtusæ. Discus tumidus glaber v. pubescens. Ovarium 2-loculare; stylus filiformis inclusus ramis 2–4 undique papillosis; ovula in loculis pauca, ad apicem placentæ carnosæ columnaris a basi loculi adscendentis sessilia. Fructus coriaceus irregulariter dehiscens, oblongus, incurvus, 2-locularis, loculis 1-spermis. Semina erecta, oblonga, obtusa, testa coriacea, albumine corneo v. carnoso; cotyledones foliaceæ; radicula cylindrica.—Suffrutices ramosi, ramulis 4-gonis, pubescentes v. tomentosi. Folia opposita, petiolata membranacea, ovato-lanceolata, nervosa, nervis obliquis. Stipulæ 3-cuspidatæ v. 3–5-setosæ. Flores dimorphici in cymas terminales corymbosas dispositi.

1. **D. glaucescens,** Hiern. in Oliv. Flor. Trop. Afr. iii. 51.

Socotra. On Haghier hills south from Tamarida. B.C.S. n. 477.

DISTRIB. Somali Land.

A small branching bush, of which we obtained specimens with foliage leaves only, appears to be this species.

2. **D. venulosa,** Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 834. Tab. XXVII, C.

Fruticosa; foliis oblongis v. oblongo-lanceolatis basi angustatis vix petiolatis acutis v. obtusis coriaceis margine revolutis, subtus venulis nigris perspicuis nervoque medio sparse puberulo; seta media stipulari lateralibus triplolongiore; floribus brevissime pedicellatis; fructu glabro disco prominulo convexo, calycis limbo expanso foliaceo panduriformi nigro-venuloso nitido.

Frutex 10-pedalis v. minor. *Rami* omnes elongati glabri. *Folia* 1–2 poll. longa $\frac{1}{2}$–$\frac{3}{4}$ poll. lata versus extremitates ramorum disposita oblonga v. oblongo-lanceolata nonnunquam subobovata basi angustata vix petiolata acuta v. obtusa sæpe subcuspidata margine obscure crenata revoluta coriacea subtus venulis nigris perspicuis venisque primariis sparse puberulis. *Stipulæ* vagina parva cuspideque centrali lateralibus duplolongiore. *Flores* dimorphici in paniculos parvos terminales breviter pedunculatos dispositi; pedicelli brevissimi vix $\frac{1}{12}$ poll. longi. *Calyx* accrescens. *Corollæ* tubus elongatus apice ampliatus intus hirsutus $\frac{5}{6}$ poll. longus, limbus 4–5-lobatus lobis apice subhamato-inflexis villosis $\frac{1}{4}$ poll. diam. *Antheræ* leves glabræ. *Discus* glaber. *Stylus* 2–4-fidus lobis supra papillosis *Fructus* 2- rarius 3-locularis $\frac{1}{6}$ poll. longus turbinatus calycis limbo dilatato foliaceo panduriformi acuto sæpissime nigriter 3-venuloso $\frac{1}{4}$ poll. longo discoque convexo prominulo coronatus. *Seminum* testa lenta, albumine carnoso.

NOM. VERN. Shohat (B.C.S.).

Socotra. Only on the higher parts of Haghier. B.C.S. n. 320. Schweinf. n. 616, in part.

DISTRIB. Endemic.

Very distinct from all the African and Madagascar species. In the short-styled flower the style is divided into four short subulate lobes, but in the long-exserted-styled flowers there are three lobes, which are longer and recurved.

3. **D. lanceolata,** Balf. fil. in. Proc. Roy. Soc. Edin. xi. (1882), 835.

Fruticosa parva ramulis tomentosis; foliis lanceolatis v. elliptico-lanceolatis sessilibus v. subsessilibus vaginis amplis acutis coriaceis supra subnitidis nervis puberulis subtus pubescentibus; cuspide media stipulari lateralibus triplolongiore; floribus breviter pedicellatis; fructu pubescente disco parum convexo, calycis limbo expanso elliptico acuto foliaceo coriaceo puberulo.

Frutex parvus ramis ultimis pubescentibus ramulisque omnibus elongatis. *Folia* lanceolata v. ovato-lanceolata acuta $1\frac{3}{4}$–$2\frac{1}{2}$ poll. longa $3\frac{1}{4}$–$1\frac{1}{6}$ poll. lata sessilia v. subsessilia versus extremitates ramulorum solum apparentia, margine integra v. obscure crenata v. revoluta, basi lamina petiolo brevi adnata, subtus pallidiora nervis pubescentibus cæteroquin puberula. *Stipulæ* vagina ampla cuspideque media lateralibus triplolongiore. *Flores* in paniculos pubescentes densos terminales aggregati; pedicelli breves $\frac{1}{12}$ poll. longi. *Calyx*

in fructu accrescens unilateraliter in laminam expansam ¼ poll. diam. ellipticam acutam coriaceam opacam venulosam scabro-puberulam dilatatus. *Fructus* puberulus ⅛ poll. longus sub calyce expanso et disco glabro vix convexo coronatus.

Socotra. On Haghier hills south from Tamarida and elsewhere. B.C.S. n. 422. Schweinf. n. 616, in part.

Distrib. Endemic.

Another distinct species, differing from the other Socotran ones by its pubescence, and therein resembling Klotzsch's Mozambique *D. pubescens* (in Monatsb. Akad. Wiss. Berol. 1853, 495, and in Peters' Mossamb. Bot. t. 48; Hiern. in Oliv. Flor. Trop. Afr. iii. 51), from which it is readily diagnosed by its leaves and fruits.

4. **D. obovata,** Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 835. Tab. XXVII, A.

Fruticosa; foliis obovatis breviter petiolatis truncatis emarginatis sæpe mucronatis rarissime acutis crassiusculis coriaceis, supra nitidis, venulis ultimis inconspicuis, margine obscure ciliatis; seta media stipulari lateralibus duplolongiore; floribus capillariter pedicellatis; fructu glabro disco plano, calycis limbo expanso membranaceo pellucido-punctulato venuloso nitido.

Frutex 10-pedalis caule erecto superne ramoso. *Rami* cortice cinerascente ramulos laterales plurimos sæpissime contractos gerentes, juveniles puberuli. *Folia* 1–1½ poll. longa ¼–¾ poll. lata breviter petiolata obovata truncata emarginata sæpe mucronata v. augustata obtusa rarissime acuta, margine obscure ciliata vix revoluta coriacea glabra supra nitida venulis ultimis inconspicuis. *Stipulæ* conspicuæ cuspide centrali maxima. *Flores* in fasciculos parvos terminales breviter pedunculatos 7–10-floros subumbellatos dispositi, bracteæ primariæ foliaceæ stipulatæ; bracteolæ minutæ, pedunculi ⅙–¼ poll. longi; pedicelli capillares ¼–⅚ poll. longi sæpe puberuli. *Calyx* in fructu accrescens unilateraliter et circumcirca expansus et alam supernam ½–¾ poll. diam. 1–5-lobam v. integram subpeltatam membranaceam nonnunquam glabram pellucido-punctulatam venulosam nitidam formans atque cum disco subplano fructum coronans. *Fructus* sub calyce ⅓ poll. longus turbinatus sæpe basi carneus.

Socotra. Common everywhere on the hills. B.C.S. n. 172.

Distrib. Endemic.

This is one of the commonest little shrubs on the island, and is widely distinct from all known species.

var. **albescens,** Balf. fil. in Proc. Roy Soc. Edin. xiii. (1883). Tab. XXVII, B.

Ramis albescentibus; foliis ad ramulos laterales contractos plurimis confertis lanceolatis v. oblanceolatis acutis valde revolutis crassiusculis; floribus sæpe solitariis; pedicellis longissimis tenuibus; calyce in fructu plerumque concavo.

Nom. Vern. Sehat (Schweinf.).

Socotra. On the plains about Galonsir. B.C.S. n. 592. Schweinf. n. 250.

Distrib. Endemic.

This plant, I think, must be taken asa variety of the foregoing species. It is on the limestone plains about Galonsir one of the commonest shrubs, and it differs from the hill form chiefly in those features which are characteristic of

dry plain plants,—shortened lateral branches with clustered leaves, hard somewhat brittle wood, and leaves more fleshy. The pedicels, too, are here longer than in the hill form.

2. PLACOPODA.

Placopoda, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 835.

Calycis tubus parvus, obconicus; limbi lobi 4, breves, acuti, æquales, persistentes, dentibus minutis fere obsoletis interjectis. Corolla tubulosa, tubo brevi intus piloso; limbi lobi 4, breves, triangulares, valvati. Stamina 4, infra faucem corollæ inserta, filamentis brevibus subulatis; antheræ inclusæ, dorso affixæ, lineari-oblongæ, utrinque obtusæ. Discus tumidus, crenatus, glaber. Ovarium 2-loculare; stylus filiformis, exsertus, ramis 2 undique papillosis; ovula in loculis pauca 2–3, in apice placentæ carnosæ columnaris a basi loculi adscendentis sessilia. Fructus corneus, indehiscens (?) compresso-campanulatus, parum bialatus, lateribus trinerviis nervis elevatis, 2-locularis, loculis 1-spermis. Semina verticalia, oblonga, obtusa, cylindracea, testa minute corrugata, albumine carnoso; cotyledones angustæ; radicula teres.—Suffrutices ramosi, ramulis 4-gonis, pubescentes proventu glabri. Folia parva, petiolata, subcrassa, elliptico-oblonga, in ramulis brevissimis verticillatis fasciculata. Stipulæ minutissimæ. Flores in cymas umbellatas simplices terminales dispositi.

A most interesting genus is this monotypic one, and the more so from the great development in Socotra of *Dirichletia*, with which it is very intimately connected. Like that genus it differs from all other *Hedyotideæ* in the mode of attachment of the ovule. The placenta forming a stout support rising from the base of the ovarian loculus, on the summit of which is seated the ovule. From *Dirichletia* its fruits at once distinguish it, for we do not find the persistent calycine wing so characteristic of the genus; but we have here a (possibly indehiscent) small compressed ribbed fruit, on the top of which the small calyx lobes are visible.

ETYM. πλαξ, anything flat or broad, and πούς, foot.

1. P. vigata, Balf. fil., *loc. cit.* Tab. XXVIII.

Suffruticosa virigata ramulis rectis divaricatis; foliis plurimis fasciculatis ellipticis v. obovatis petiolatis.

Suffrutex parvus ramis ultimis elongatis rectis laterales ramulos plurimos gerentibus cum foliis pluribus ad apices fasciculatis. *Folia* breviter petiolata 8–12 in quoque fasciculo elliptica v. oblongo-elliptica v. obovata acuta v. obtusa et apiculata $\frac{1}{4}$–$\frac{1}{3}$ poll. longa $\frac{1}{12}$ poll. lata (petiolo $\frac{1}{16}$ poll. longo) margine revoluta, glabra coriacea *Flores* inter folia fasciculati ad apices ramulorum lateralium; pedicelli capillares $\frac{1}{12}$–$\frac{1}{8}$ poll. longi. *Calycis* lobi ovati subacuti $\frac{1}{24}$ poll. longi glabri. *Corollæ* tubus $\frac{1}{8}$ poll. longus. *Fructus* $\frac{1}{8}$ poll. longus $\frac{1}{8}$ poll. latus glaber nitidus.

NOM. VERN. Difeth (Schweinf.).

Socotra. Abundant on the plains. B.C.S. n. 25. Schweinf. n. 476.

DISTRIB. Endemic.

A very distinct plant, and characteristic of the plains; especially abundant on Hadibu plain.

var. **nana**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Nana ramis validioribus et ramulis brevibus prostratis; foliis plerumque minoribus paucioribus et solum 2–5 in quoque fasciculo distincte obovatis crassiusculis.

Socotra. On the plains. B.C.S. n. 86.

Distrib. Endemic.

A form of this species with quite a different appearance from the type, but which cannot be separated as a species. The plant branches with no long rigid twigs, and the smaller leaves few in each cluster, are very characteristic.

8. HEDYOTIS.

Hedyotis, Linn. Gen. n. 118; Benth. et Hook. Gen. Pl. ii. 56.

A large genus of the warmer regions of the globe. The three Socotran species are endemic, and present some curious features. One of them is very nearly an *Oldenlandia*, as that genus is distinguished from *Hedyotis*.

1. H. pulvinata, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Herba pulvinata congesta; foliis parvis anguste acinaciformibus crassis triquetris imbricatis; stipulis connatis fimbriatis; floribus sessilibus axillaribus solitariis; stylo bifido.

Herba cæspitosa depressa pulvinata dense ramosa ramis congestis internodiis contractis. *Folia* opposita arcte imbricata 1 poll. nonnunquam $\frac{1}{5}$ poll. longa $\frac{1}{6}$ poll. lata crassa anguste acinaciformia a basi sursum gradatim triquetro-dilatata apice acuta v. obtusa supra subcanaliculata margine obscure papillosa paginis tessalatim subtuberculatis basi abrupte in stipulas connatas membranaceas flexuose et multo-fimbriatas contracta. *Flores* dilute violacei in axillis foliorum superiorum sessiles. *Calycis* tubus membranaceus brevis extus sparse strigulosus, limbus alte 4-fidus tubo dimidio longior, lobis $\frac{1}{8}$ poll. longis longe acutis nervo medio viridi supra papillulatis margine membranaceo fimbriato. *Corollæ* tubus $\frac{3}{10}$ poll. longus infra cylindricus sursum anguste ampliatus fauce villoso dilatato, limbi lobi 4 lanceolati $\frac{1}{8}$ poll. longi acuti intus villosi. *Stamina* 4 subsessilia angulis limbi loborum inserta; antheræ oblongæ $\frac{1}{16}$ poll. longæ. *Ovarium* inferum apice vix bilobatum biloculare, loculis multiovulatis; stylus tubo corollæ æquilongus filiformis bifidus segmentis pilosis $\frac{1}{10}$ poll. longis. *Fructus* globosus in carpella 2 septicide fissens. *Semina* in quoque loculo 4 glabra angulata.

Socotra. Very common on the plains about Galonsir. B.C.S. nn. 15, 719. Schweinf. n. 716.

Distrib. Endemic.

A very distinct species, having no near resemblance with any other species. Perhaps its nearest likeness is to be found in the cæspitose forms of *H. pinifolia*, Wall. (Cat. 850; Hook. fil. Flor. Brit. Ind. iii. 60), a plant of eastern Asia. But from all species its foliage is quite diagnostic as well as its habit. A very congested form is the commonest on the island—our n. 15. On it the leaves are very small and form sets of rosettes. But we have (n. 719) a more laxly branched and spreading form with tufts of much longer leaves.

2. H. bicornuta, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Annua minuta plantaginea; foliis aggregatis linearibus basi in stipulas connatas paucifimbriatas expansis revolutis minute papillosis; floribus axillaribus sessilibus solitariis; stylo bifido; fructu compresso vertice bifido bicornuto septicide dehiscente; seminibus foveolatis angulatis.

Herba minuta annua caule brevissimo (1–2-pollicari) sæpe fere nullo subquadrangulari erecto basi nudo cum internodio unico elongato v. rarius duobus ramulis contractis cum foliis cæspitem terminalem v. lateralem formantibus. *Folia* sessilia opposita imbricata congesta $\frac{3}{4}$–$1\frac{1}{4}$ poll. longa v. minora linearia acuta basi in stipulas connatas membranaceas pauciciliatas v. fimbriatas (fimbriis serratis) abrupte expansa crassiuscula plus minusve papillosa margine revoluta subtus nervo medio prominente. *Flores* solitarii sessiles axillares. *Calyx* persistens alte 5-partitus, tubo brevi membranaceo, lobis $\frac{1}{8}$ poll. longis subinæqualibus lanceolatis longe acutis nervo medio viridescente supra tuberculato marginibus membranaceis serratis. *Corollæ* tubus $\frac{5}{12}$ poll. longus filiformis fauce parum ampliato, limbi lobi 4 poll. longi lanceolati acuti. *Stamina* fauci adnata exserta filamentis distinctis; antheræ oblongæ breves. *Ovarium* inferum apice bilobatum membranaceum 2-loculare; stylus elongatus bifidus segmentis $\frac{1}{18}$ poll. longis pilosis. *Capsula* purpurascentia bilocularia ultra calycem persistentem vertice vacuo protruso et bifido subbicornuto compressa glabra septicide dehiscentia, pericarpio coriaceo intus nitido. *Semina* plurima oblonga angulata foveolata glabra $\frac{1}{24}$ poll. longa.

Socotra. Near Galonsir. B.C.S. n. 178.

Distrib. Endemic.

Another plant I have referred to this genus. It has a very strong plantagineoid habit. Its inferior ovary relegates it to Rubiaceæ, and it appears to fall into this genus. The fruit is however very peculiar, being quite flattened and with an empty vertex, which is bifid and elongated so as to form a couple of short projections beyond the persistent calyx.

3. H. stellarioides; Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 836.

Annua tenuis caule tetraquetro scabridulo; foliis remotis subsessilibus elliptico-oblongis v. trapeziformibus v. sublanceolatis acutis revolutis subciliatis; stipulis 2–3-dentatis; cymis terminalibus spurie abortu dichotomis; pedicellis filiformibus rigidis longis; floribus parvis albis; stylo integro apice capitato; fructu non-exserto capsulari pyriformi septicide ad basin bivalvim fissente, carpellis ventraliter dehiscentibus.

Herba vix pedalis tenuis annua erecta a basi bipartim ramosa. *Rami* tetraquetri scabriduli internodiis elongatis. *Folia* sessilia v. subsessilia remota $\frac{5}{12}$–$\frac{2}{3}$ poll. longa $\frac{1}{6}$–$\frac{1}{4}$ poll. lata oblongo-elliptica v. subtrapeziformia v. lanceolata acuta basi contracta revoluta integra v. vix undulata breviter ciliata sæpe fere glabra interdum plus minus scabridula sæpe subcoriacea nervulis paucis delicatulis subtus pallidiora. *Stipulæ* minutæ 2–3-dentatæ. *Flores* parvi albi v. albo-purpurei in cymas terminales spurie dichotomas abortu unilaterales dispositi; pedicelli erecti rigidi filiformes $\frac{1}{2}$–1 poll. longi. *Calyx* ad medium 4-fidus, lobis æqualibus lanceolato-acutis carinatis extus scabridis intus sparsim strigosis. *Corollæ* tubus $\frac{1}{8}$ poll. longus apice subampliatus extus minute furfuraceus, limbi lobi tubo subæquilongi lanceolato-acuti v. obtusi. *Stamina* 4. *Stylus* corollæ tubo vix æquilongus pilosus apice capitatus. *Fructus* $\frac{1}{5}$ poll. longus pyriformis glabrescens v. strigosus in

valvos duos septicide fissens, carpello quoque verticaliter dehiscente, apice carpellorum ultra calycem non protruso. *Semina* ∞ nigra punctulata.

Socotra. Common on the hill slopes. B.C.S. n. 313. Schweinf. n. 633.

Distrib. Endemic.

A pretty little herb and quite distinct as a species. Its nearest ally is *H. Wallichii;* Kurz. (in Journ. Asiat. Soc. xlv. (1876), ii. 136; Hook. fil. Flor. Brit. Ind. iii. 53), a plant of Tenasserim and the Nicobar islands, extending to Borneo. But ours is a more delicate plant, with different flowers and fruit. Hooker (*loc. cit.*) remarks of the Indian plant:—"possibly an *Oldenlandia,* but the capsules dehisce septicidally to the base." Our plant farther differs from *Oldenlandia* in the apex of the style, which is simple and capitate, not bifid.

Schweinfurth's specimens, collected near Kischen, generally differ from ours in being more scabrous and with the calyx lobes rounded and more strigose.

4. OLDENLANDIA.

Oldenlandia, Linn. Gen. n. 154; Benth. et Hook. Gen. Pl. ii. 58.

A large genus of tropical and subtropical regions of the world. Of the three Socotran species one is cosmopolitan in the tropics, one is a common Asiatic species, and the third belongs to the regions of north-east Africa and south-west Europe.

1. **O. Schimperi,** T. Anders in Journ. Linn. Soc. v. (1860), Suppl. 21; Boiss. Flor. Orient. iii. 11; Hiern in Oliv. Flor. Trop. Afr. iii. 55. Hiern gives the extensive synonymy of the species.

Socotra. On the plains. B.C.S. n. 59. Schweinf. n. 548.

Distrib. Nile Land and Egypt, Arabia and Scindh.

The Socotran plant varies much. Many specimens are quite typical in their dull scabrid character, but many are quite glabrous and shining, and this especially in the case of old plants. In no instance do we find our plants showing the narrowly elliptic subobtuse form of corolla-lobe described in the type; the form is usually narrow linear-acute, and the lobes are relatively longer than is typical.

2. **O. corymbosa,** Linn. Sp. 174; DC. Prod. iv. 426; Hiern in Oliv. Flor. Trop. Afr. iii. 62; Hook. fil. Flor. Brit. Ind. iii. 64. An extensive synonymy is given by authors quoted.

Socotra. Common. B.C.S. n. 582. Schweinf. nn. 323, 683, 702.

Distrib. Common tropical weed.

3. **O. Heynei,** Oliv. in Trans. Linn. Soc. xxix. (1875), 84; Hiern in Oliv. Flor. Trop. Afr. iii. 59; Hook. fil. Flor. Brit. Ind. iii. 65.

Socotra. Not uncommon on the hill slopes. B.C.S. n. 381. Schweinf. nn. 469, 625.

Distrib. East Indies, India, and tropical Africa; also Madagascar and South Africa.

The fruits in the Socotran plants are usually strigulose-scabrid, which is not usually their character in the type, though I find it in some Abyssinian specimens.

5. MUSSÆNDA.

Mussænda, Linn. Gen. n. 241; Benth. et Hook. Gen. Pl. ii. 64.

A considerable genus, inhabiting the warmer regions of Asia, Africa, and the islands of the Indian and Pacific Oceans.

Under the generic character, Bentham and Hooker remark:—"*M. luteola*, Delile (perperam ad *Neurocarpæam*, R. Br. relata ab Endl. Gen. Pl. 563) a congeneribus differt fructu vere capsulari, ad basin loculicide? dehiscente, qua re ad tribum *Condaminearum* tendit." The Socotran plant confirms the occurrence of loculicidally dehiscing fruits in species of the genus, and in its characters tends rather in the direction of the *Hedyotideæ*, and with the genus *Pentas* of that tribe it educes the very near affinity of *Mussænda*.

M. capsulifera, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 836. Tab. XXIX.

Arborea ramis juvenilibus tetragonis pubescentibus; foliis oblongo-ellipticis v. obovatis acutis v. obtusis basi contractis subsessilibus coriaceis fere glabris; stipulis dentatis; floribus in rigidas erectas terminales cymas dispositis; calycis lobis æqualibus foliaceis linearibus; corolla elongata, limbis obcuneatis; fructu sicco loculicide dehiscente.

Arbor parva ramis vix tetragonis juvenilibus pubescentibus. *Folia* subsessilia v. brevissime petiolata $1\frac{3}{4}$–$2\frac{1}{2}$ poll. longa $\frac{1}{2}$–1 poll. lata oblongo-elliptica v. obovata rarissime ovata v. sublanceolata acuta v. obtusa basi contracta integra coriacea obscure pellucido-punctulata, subtus glanduloso-papillulata nervis paucis pilis adpressis instructis supra nitida. *Stipulæ* dentatæ. *Flores* $1\frac{3}{4}$ poll. longi breviter pedicellati in corymbas terminales parvas rigidas erectas dispositi; pedicelli vix $\frac{1}{12}$ poll. longi; bracteolæ subflorales acuminatæ minutæ. *Calycis* tubus fere nullus, lobi 5 lineares acuti æquales persistentes $\frac{1}{4}$ poll. longi proventu elongati strigulosi. *Corolla* flava, tubo 1–$1\frac{1}{4}$ poll. longo angusto cylindraceo supra vix ampliato extus dense striguloso-puberulo fauce villoso-hirsuto, limbi $\frac{1}{2}$ poll. diam. lobis obcuneatis truncatis emarginatis mucronatis. *Stylus* bifidus lobis crassis. *Fructus* ellipsoideus $\frac{1}{4}$ poll. longus breviter strigulosus loculicide dehiscens. *Semina* striata foveolata angulata.

Nom Vern. Ōd-el-kseh (Schweinf.).

Socotra. On the hills. B.C.S. n. 550. Schweinf. nn. 455, 571.

Distrib. Endemic.

Like *M. luteola*, Del. (Cent. Pl. Afr. Cailliaud 65, t. 1, f. 1 excl. syn., non Hochst; Hiern in Oliv. Flor. Trop. Afr. iii. 71), from Nile Land, our plant is peculiar in its capsular dehiscing fruit. From the Nile Land species our plant

is readily distinguished by, amongst other characters, the absence of the enlarged calyx lobe.

6. GAILLONIA.

Gaillonia, Ach. Rich. in Mem. Soc. Hist. Nat. Par. v. 153, t. 15, f. 3; Benth. et Hook. Gen. Pl. ii. 144.

A small genus of northern Africa and western Asia, represented in Socotra by three endemic species.

1. G. (Microstephus) **tinctoria**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 836.

Herba a collo radicis tortuose ramosa, ramis nigris, internodiis brevibus puberulis; foliis crassiusculis anguste spathulatis, sparse et brevissime puberulis; stipulis polymorphis; floribus solitariis axillaribus breviter pedicellatis; calyce 5-lobato, lobis 2 magnis, 2 minoribus, 1 mimino; corolla extus scabridula; stylo longe exserto.

Herba basi lignosa pedalis v. sesquipedalis ramosissima radice corticaliter rubro-tinctorio. *Rami* tortuosi internodiis brevibus; ramuli subtetragoni scabriusculo-puberuli. *Folia* $\frac{1}{2}$–$\frac{2}{3}$ poll. longa $\frac{1}{24}$ poll. lata basi ramulorum lateralium sæpe congesta crassiuscula omnia anguste spathulata basi multo-attenuata scabriuscula siccitate nigricantia. *Stipulæ* vagina brevi minute dentata. *Flores* fere $\frac{5}{12}$ poll. longi solitarii axillares; pedicelli vix $\frac{1}{12}$ poll. longi puberuli. *Calyx* persistens non-accrescens 5-lobatus puberulus, lobis 2 magnis subulatis, 2 minoribus, 1 minimis. *Corolla* $\frac{1}{5}$ poll. longa calycem longe excedens tubulosa extus scabridula, limbo $\frac{1}{16}$ poll. longo. *Stamina* corollæ æquilonga. *Stylus* bifidus longe exsertus. *Fructus* ignotus.

Socotra. In tufts on rocks near Galonsir. B.C.S. n. 321.

Quite a distinct species of the section including those without accrescent calyces. It has no very marked allies in the genus. The outer portion of the root is reddish in colour, and when fresh dyes the fingers. It is made use of by the inhabitants of Socotra as a dye.

2. G. (Microstephus) **puberula**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 836.

Suffruticosa rigida dichotome ramosa puberulo-tomentosa internodiis elongatis; foliis inferioribus lanceolatis v. oblanceolatis v. obovatis acutis v. obtusis revolutis sparse puberulis, superioribus linearibus; stipulis polymorphis; floribus axillaribus v. terminalibus solitariis v. in cymas trifloras dispositis; calycis dentibus subæqualibus non-accrescentibus; corolla extus pubescente; staminibus sæpius inæqualibus; stylo incluso; fructu dentibus calycis coronato dense hirsuto.

Suffrutex rigidus virgatim bipartim pauciramosus basi lignosus 2–3-pedalis. *Rami* tenues elongati recti tetragoni internodiis longis sursum dilatatis deorsum versus nodos attenuatis, juveniles puberuli, seniores epidermide albido-tomentoso. *Folia* remota siccitate nigra, basalia $\frac{1}{2}$ poll. longa $\frac{1}{6}$ poll. lata lanceolata v. oblanceolata v. ovata acuta v. obtusa basi attenuata margine revoluta, sparsim puberula, superiora angusta linearia. *Stipulæ* vagina brevi setis duobus brevissimis v. obsoletis. *Flores* non-involucellati solitarii v. in cymas

trifloras axillares v. terminales subsessiles ½ poll. longas dispositi. *Calycis* dentes 4 minutissimi subæquales. *Corolla* hypocrateriformis, tubo extus pubescente calycem longe excedente fauce subampliato, limbi lobis 5 angustis acutis tubo subæquilongis. *Stamina* 5, duorum filamentis longis corolla vix brevioribus, trium filamentis brevibus. *Stylus* staminibus brevior breviter bifidus puberulus. *Fructus* ⅕ poll. longus dense hirsutus dentibus minutis calycinis apice cinctus in coccos duos oblongos hirsutos secedens.

Socotra. A not uncommon plant. B.C.S. n. 155. Schweinf. n. 602.

Distrib. Endemic.

Another distinct species, belonging to the same section of the genus as the foregoing. Its nearest ally appears to be an undescribed Afghan species (Griffith n. 3062), of which a specimen is in Kew Herbarium; but that has a very woolly fruit.

3. G. (Microstephus) **thymoides**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 837.

Suffruticosa parva rigida dense dichotome ramosa, ramis strictis divaricatis scabrido-puberulis; foliis petiolatis oblongo-ellipticis v. lanceolatis obtusis v. acutis revolutis scabro-puberulis, sæpe ad basin ramorum confertis; stipulis heteromorphis; floribus axillaribus solitariis brevissime pedicellatis; calyce 5-lobato, lobis 3 magnis subulatis, 2 parvis hirsutis; corolla extus puberula; stylo exserto; fructu hirsuto.

Suffrutex rigidus lignosus 2-pedalis spuriosim dichotome ramosissimus. *Rami* stricti virgati divaricati albidi subtetragoni internodiis brevibus deorsum attenuatis, juveniles scabrido-puberuli seniores epidermide albido vestiti. *Folia* petiolata opposita ½–⅔ poll. longa sæpe breviora ⅛ poll. lata sæpe 3–4 basi ramulorum lateralium in axillis conferta oblongo-elliptica v. lanceolata obtusa v. acuta margine revoluta scabro-puberula siccitate nigricantia subtus pallidiora; petiolus $\frac{1}{12}$–$\frac{1}{6}$ poll. longus. *Stipulæ* vagina minute truncata v. setacea. *Flores* ⅓ poll. longi brevissime pedicellati axillares solitarii. *Calyx* persistens non-accrescens 5-lobatus, lobis 3 magnis $\frac{1}{16}$ poll. longis subulatis, 2 parvis, hirsutis. *Corollæ* tubus ¼ poll. longus angustus supra subampliatus extus puberulus, limbi lobi 5 acuti inflexi. *Stamina* 5 corollæ subæquilonga, 2 sæpe breviora. *Stylus* bilobatus supra puberulus exsertus. *Fructus* dense hirsutus.

Socotra. Very common. B.C.S. n. 187. Schweinf. n. 254.

A third species of the same section as the other Socotran ones. As a distinct species the most marked features of this plant are its freely branching habit, the leaf forms, and the hirsute fruit. These separate it from its allies, the nearest of which is the Persian *G. eriantha*, Jaub. et Spach. (Ill. Pl. Or. i. 145, t. 78), but the affinity is not close.

The plant forms small tufty bushes, and grows everywhere on the island.

7. SPERMACOCE.

Spermacoce, Linn. Gen. n. 119; Benth. et Hook. Gen. Pl. ii. 145.

A large genus of tropical and sparingly of subtropical regions; mostly American.

S. hispida, Linn. Sp. 148; DC. Prod. iv. 555; Hook. fil. Flor. Brit. Ind. iii. 200.

Socotra. At Tamarida. B.C.S. n. 455. Schweinf. n. 299.

Distrib. Throughout India and the Eastern Archipelago. A variable plant on Socotra.

8. VAILLANTIA.

Vaillantia, DC. Flor. Franc. iv. 266, and Prod. iv. 613; Benth. et Hook. Gen. Pl. ii. 148.

A small genus of the Mediterranean region and western Asia.

V. hispida, Linn. Sp. 1490; DC. Prod. iv. 614; Boiss. Flor. Orient. iii. 82; Hiern in Oliv. Flor. Trop. Afr. iii. 246; Sibth. Flor. Græc. t. 138.

Socotra. On the hill slopes. B.C.S. n. 452.

Distrib. A plant of the Mediterranean region, and reaching from the Canary Islands to south Persia.

9. GALIUM.

Galium, Linn. Gen. n. 125; Benth. et Hook. Gen. Pl. ii. 149.

A very large genus, chiefly of temperate climates, but spread all over the globe.

G. Aparine, Linn. Sp. 157; DC. Prod. iv. 608; Boiss. Flor. Orient. iii. 68; Hiern in Oliv. Flor. Trop. Afr. iii. 245; Hook. fil. Flor. Brit. Ind. iii. 205.

Socotra. On the higher parts of Haghier. B.C.S. n. 480. Schweinf. n. 641.

Distrib. A widely spread old world species.

The form of this species with small hispid fruit is that which occurs on Socotra.

Order XXXV. VALERIANEÆ.

A large order, chiefly distributed in the temperate regions of the northern hemisphere of both old and new worlds, very few occurring in the tropics.

VALERIANELLA.

Valerianella, Mönch. Meth. Bot. 493 pro parte: Benth. et Hook. Gen. Pl. ii. 156.

A genus of about twenty species of herbs, several of them social weeds, distributed through Europe, northern Africa, western Asia, and north America.

V. affinis, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 837.

Pusilla sparsim bipartim ramosa; foliis inferioribus oblongo-ellipticis v. oblanceolatis obtusis obscure dentatis, superioribus sæpe linearibus remote acuteque dentatis v. interdum trifidis; cymis paucifloris, bracteis scarioso-marginatis; calyce rotato-campanulato herbaceo

utrinque glabro reticulato-venuloso 6-fido, lobis uncinulatis inæqualibus; capsulis calyci æquilongis puberulis antice obcuneatim sulcatis, loculis sterilibus subteretibus.

Herba pusilla tenuis 3–5-pollicaris. *Caulis* sulcatus subpaleaceo-puberulus divaricatim sparsim bipartim ramosus. *Folia* inferiora anguste oblongo-elliptica v. oblanceolata obtusa basi attenuata in petiolum brevem alatum amplexicaule 1 poll. longa $\frac{1}{5}$–$\frac{1}{4}$ poll. lata obscure dentata, superiora oblanceolata v. linearia remote acute dentata v. interdum trilobata lobis lateralibus minimis angustatis, omnia revoluta membranacea glabra v. inconspicue puberula. *Cymæ* parvæ 3–4-floræ subcapitatæ, bracteis anguste-lanceolatis acutis scarioso-marginatis glabris. *Calyx* rotato-companulatus utrinque glaber herbaceus perspicue reticulato-venulosus capsulo fere æquilongus apice latior ultra medium inæqualiter sinuato-quinquifidus, lobis subtriangularibus in cuspides uncinulatas productis, postico maximo. *Capsula* ovoidea subtetragona vix $\frac{1}{12}$ poll. longa adpresse-puberula postice subplana antice sulco profundo obcuneato v. obovato fructu angustiore et paullo breviore notata, loculis sterilibus introrsum contiguis subteretibus fertili triangulari transverse elongato subminoribus.

Socotra. A not uncommon annual on dry hill slopes near Galonsir, along with *Campanula dichotoma, Erythræa Centaurium,* and others. B.C.S. n. 551.

Distrib. Endemic.

Apparently a quite distinct species of the section *Platycœlæ.* Its nearest allies are found in the Spanish *V. divaricata,* Lange (Krok Monog. in k. Svensk. Vetensk. Akad. Handl. v. (1864), n. 1. 77, t. iii, f. 31), the widely spread *V. coronata,* Willd. (Krok *loc. cit.* 78, t. iii, f. 32), a plant of Europe and the Mediterranean region, and *V. Kotschyi,* Boiss. (Krok *loc. cit.* 80, t. iii, f. 33), a Syrian species. From all of them it differs in its delicate habit and very small-headed cymes with few flowers, whilst the characters of the fruit and calyx are diagnostic in each instance. The Spanish plant is the most nearly allied, but has more widely grooved fruits and a smaller calyx with equal lobes. Amongst the species of the section which have the calyx-limb internally hirsute, *V. chlorodonta,* Coss. and Dur. (Krok *loc. cit.* 81, t. iii, f. 35), has the greatest resemblance to it.

Order XXXVI. COMPOSITÆ.

A very vast order, the third largest in the flora, comprising twenty-four genera. Of these, eleven are genera containing weeds widely spread in both hemispheres, often of cultivation; four have a pretty wide old-world distribution, one of them having its headquarters at the Cape of Good Hope, another in the Mediterranean region; three,—*Heterachæna, Volutarella,* and *Reichardia,*—have a more limited old-world distribution, being characteristic of northern Africa and south-western and western Asia, the last two reaching into south Europe; three,—*Tripteris, Dicoma,* and *Euryops,*—are essentially south African genera, but by isolated species are represented in north Africa, *Euryops* spreading to Arabia, and *Dicoma* to the Indian peninsula; one, *Psiadia,* is a tropical African and Indian Ocean island genus, with a species in Arabia; *Prenanthes* is an Asiatic, European, and American genus, absent from Africa, and *Achyrocline* is an American genus, with a representative in tropical Africa and Madagascar.

1. VERNONIA.

Vernonia, Schreb. Gen. Pl. ii. 541; Benth. et Hook. Gen. Pl. ii. 227.

A vast genus of shrubby and herbaceous plants of very variable characters, occurring in the tropics and warmer regions of both hemispheres. Most abundant in Brazil. Three species are found in Socotra, of which one is endemic, one is an east African and south-west Asian species, and the third is a common African and Asian form, which reaches Australia.

1. V. (Lepidella) **Cockburniana,** Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 837. Tab. XXX.

Fruticosa plus minusve canescens ramis sæpe virgatis sed plurimis lateralibus abbreviatis; foliis obovatis obtusis v. emarginatis integris remotis v. ad apices ramorum contractorum fasciculatis; capitulis majusculis 10–13-floris solitariis v. 2–3 in cymas ad apices ramorum lateralium dispositis; phyllariis multiseriatis obtusis ciliatis extus pubescentibus, interioribus persistentibus; acheniis 6–9-costatis intervallis sessili-glandulosis pilisque suffultis; pappo exteriore squamiformi brevi.

Frutex in locis gratis 15-pedalis arcte ramosus cum ramulis elongatis virgatis angulatis striatis incano-tomentosis subfulvis perplurimisque lateralibus abbreviatis rugosis, in locis aridis nanus tortuoso-lignosus ramulisque omnibus deformibus approximatis. *Folia* in ramis elongatis remota ad apices ramulorum contractorum fasciculata $\frac{3}{4}$–1 poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata obovata obtusa sæpe emarginata in petiolum brevem attenuata integra supra canescentia subtus pallidiora sericeo-canescentia, petiolo $\frac{1}{4}$ poll. longo baseo incrassato persistente; in forma ê locis siccis folia sparsa multo minora. *Alabastri* fulvo pubescentes. *Capitula* subcampanulata $\frac{1}{6}$–$\frac{1}{5}$ poll. diam. 10–13-flora (pedicellis validis incanis $\frac{1}{4}$–$\frac{1}{3}$ poll. longis), ad extremitates ramorum abbreviatorum solitaria v. in cymas parvas 2–3-capitatas disposita. *Phyllaria* multiseriata imbricato-appressa capitulis breviora obtusa extus pubescentia marginibus submembranaceis superne ciliatis, interiora persistentia, intima lineari-oblonga $\frac{1}{5}$ poll. longa, exteriora gradatim minora, extima minutissima squamiformia. *Receptacula* nuda. *Corolla* extus sessili-glandulosa. *Antherarum* caudæ obtusæ. *Achenia* $\frac{1}{8}$ poll. longa angulata (6–9), prominenter 6–9-costata jugis glabris, intervallis albido-glandulosis pilisque paucis tenuibus adscendentibus instructis. *Pappus* duplex fulvus, exterior persistens brevis $\frac{1}{36}$ poll. longus squamiformis, interior setiformis barbatus persistens.

Socotra. Not uncommon, both on the limestone and the granitic regions, ascending to about 2000 feet. B.C.S. nn. 226, 266. Schweinf. nn. 513, 647, 770.

Distrib. Endemic.

A very distinct species of the section *Lepidella*. Like so many other plants, its aspect on the granitic soil is very different from its appearance on the limestone; on the former, a handsome shrub or small tree, copiously leaved, and with often long hanging branches; on the latter, a scrubby dwarf not a foot high, with hard-wooded twisted stems, and branches bearing few and small leaves. One finds intermediate states.

Schweinfurth's specimen, 647, is with doubt regarded as a form of this species, the leaves being so large, almost an inch long.

The more luxuriant growths of the plant are liable to the attacks of a gall-forming insect. It affects the receptacle, forming therein a two-celled gall with a hard bony wall. The effect of this upon the surrounding parts is, that whilst the flowers abort, the inner three or four series of phyllaries increase to about twice their ordinary size, and form leaf-like more or less hoary structures, containing chlorophyll, and approaching somewhat the form of the foliage leaves. On some of our specimens nearly every flower head is thus altered, and as the shape of the head and the form of the outer phyllaries are not affected, one would at first take this phyllody of the inner phyllaries to be the result of some general cause, and not due to a specific injury in each instance. In a few cases the stems are also injured by a gall.

2. V. (Tephrodes) **spathulata**, Hochst. in herb. Schimp. Abyss. (ed. Hohenack.) n. 2133.

V. cinerascens, Sch. Bip. in Schweinf. Flor. Æthiop. 162; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 275.

Socotra. Common on the plains about Galonsir. B.C.S. n. 716.

Distrib. Abyssinia, Arabia, Beloochistan, and north-west India.

A species having a near alliance, as Ascherson points out (in Schweinf. Flor. Æthiop. 162), with *V. atriplicifolia*, Jaub. et Spach (Ill. Pl. Or. iv. 94, t. 359), but quite distinct from it, and easily recognised by its more shrubby habit, quite different foliage, and its setaceous outer pappus.

Some confusion in the nomenclature of the species has occurred. The plant named above by Jaubert and Spach having been identified as *Chrysocoma spathulata*, Forsk. (Flor. Ægypt. Arab. 147), Schultz has (*loc. cit.*) taken Forskål's specific name for it, and this is adopted by Vatke (in Œster. Bot. Zeitschr. xxv. (1875), 323) in his determination of Hildebrandt's Aden and Somali Land plants. But the name *V. spathulata* applied by Hochstetter to our plant must take precedence of Schultz's name, and for Forskål's plant Jaubert and Spach's name should be adopted. Oliver and Hiern (*loc. cit.*) appear to have been misled by this nomenclature, as in a note to *V. cinerascens* they say, remarking on its resemblance with *V. atriplicifolia*, "Vatke unites the species." This, however, is not the case. Vatke says "768 *V. spathulata* (Forsk.) C. H. Schultz Bip. in Schweinf. Beit. 162 (*V. atriplicifolia*, Jaub. et Spach), Aden ad montes, &c." I have seen Hildebrandt's n. 768, and it is genuine *V. atriplicifolia*, Jaub. et Spach.

3. V. (Tephrodes) **cinerea**, Less. in Linnæa, iv. (1829), 291, and vi. (1831), 673; DC. Prod. v. 24, and vii. 263; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 275; Hook. fil. Flor. Brit. Ind. iii. 233.

For extensive synonymy see authors quoted.

Socotra. Common. B.C.S. nn. 393, 460. Schweinf. n. 284.

Distrib. Common in tropical Asia, Africa, and Australia.

2. AGERATUM.

Ageratum, Linn. Gen. n. 936; Benth. et Hook. Gen. Pl. ii. 241.

A genus of about sixteen species. They are American herbs or shrubs, but one is widely spread throughout the tropics.

A. conyzoides, Linn. Sp. 1175; DC. Prod. v. 108; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 300; Hook. fil. Flor. Brit. Ind. iii. 243.

Socotra. About Tamarida. B.C.S. n. 614. Schweinf. n. 285.

Distrib. Cosmopolitan in the tropics.

3. DICHROCEPHALA.

Dichrocephala, DC. in Guill. Archiv. Bot. ii. 517, and Prod. v. 371; Benth. et Hook. Gen. Pl. ii. 260.

A genus of herbs, referable to five species confined to the tropics of the old world.

D. chrysanthemifolia, DC. Prod. v. 372; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 303; Hook. fil. Flor. Brit. Ind. iii. 245; Wight Ic. t. 1095.

Nom. Vern. Tobinhay (B.C.S.).

Socotra. On the top of Haghier above Adona. Altitude over 4000 feet. B.C.S. n. 241.

Distrib. Tropical Africa and Madagascar, India and the east.

Our Socotran plant, referred to this species, differs from the type in some points. It is a much more hairy plant, and the achenes are not quite glabrous, but are slightly glandulose towards the apex, and the leaves have much less acutely cut segments.

4. CONYZA.

Conyza, Less. Syn. Comp. 203; Linn. Gen. n. 950, pro parte; Benth. et Hook. Gen. Pl. ii. 283.

A genus containing about fifty species of herbs, rarely shrubs, widely dispersed in the warmer regions of both hemispheres.

C. Hochstetteri, Schultz Bip. in herb. Schimp. Arab. nn. 162, 1366; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 312.

Socotra. Not common. B.C.S. n. 598. Schweinf. n. 617.

Distrib. Abyssinia.

5. PSIADIA.

Psiadia, Jacq. Hort. Schœnbr. ii. 13, t. 152; Benth. et Hook. Gen. Pl. ii. 284.

A small genus of about twenty species of shrubby plants, restricted to the

tropical and subtropical regions of Africa, to Madagascar, and the Mascarene Islands; but one African species extends to Arabia.

P. Schweinfurthii, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 838. Tab. XXXI.

Suffruticosa glaucescens non glutinosa; foliis lanceolatis petiolatis acutis integris v. supra obscure dentato-serratis glanduloso-puberulis crassiusculis; capitulis parvis copiose paniculato-corymbosis; phyllariis 5-seriatis exterioribus glanduloso-puberulis, internis glabris; stylis exsertis; acheniis pilis adscendentibus vestitis; pappi setis basi connatis.

Suffrutex 5-pedalis glaucescens ramulis validis striatis glanduloso-puberulis. *Folia* lanceolata petiolata 2½–3¼ poll. longa ⅔–¾ poll. lata acuta sæpe obliqua basi inæqualia integra v. supra obscure dentato-crenata anguste revoluta crassa copiose glanduloso-puberula glaucescentia pellucido-venulosa nervis primariis subprominulis, petiolo ⅓ poll. longo subamplexicauli. *Capitula* multiflora parva hemisphærica ¼ poll. diam. in copiosos paniculatos corymbos terminales disposita; pedunculi glanduloso-puberuli striati sæpeque complanati, ultimi ⅓ poll. longi. *Phyllaria* 5-seriata, intima lineari-oblonga obtusa glabra margine scariosa, exteriora gradatim minora dorsaliter glanduloso-puberula, extima pauca squamiformia. *Flores* flavi. ♀ corollæ ligula integra. ☿ corollæ tubus sursum ampliatus 5-dentatus. *Antheræ* subacutæ exsertæ. *Styli* exserti lobis lanceolatis intus planis glabris extus convexis hirtellis. *Receptaculum* fimbrilliferum. *Achenia* costata pilis adscendentibus instructa. *Pappus* setiformis setis basi connatis barbellatis.

Nom. Vern. Kchass (Schweinf.).

Socotra. Kischen, at an altitude of about 1800 feet. Schweinf. n. 606.

Distrib. Endemic.

A non-glutinous species sent by Schweinfurth. We did not obtain it. It has close affinity with *P. dodonææfolia*, Steetz (in Peters' Mossamb. Bot. 385), a plant of Zanzibar and Madagascar, considered by Oliver and Hiern (in Oliv. Flor. Trop. Afr. iii. 319) as possibly a form of *P. arabica*, Jaub. et Spach (Ill. Pl. Or. iv. 85. tt. 352, 353), the only species of the genus found in Asia. But the glaucescent non-glutinous character, the larger inflorescences, and the flowers of our plant are sufficiently diagnostic.

6. PLUCHEA.

Pluchea, Cass. in Bull. Philom. 1817, and in Dict. xlii. (1826), 1; Benth. et Hook. Gen. Pl. ii. 290.

A genus of some thirty-five species of shrubby and half-shrubby plants, distributed throughout the warmer regions of America, a few in Africa and Asia, and some in Australia. The three Socotran representatives are endemic.

1. P. glutinosa, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 838.

Suffruticosa glutinosa glabra; foliis oblanceolatis v. lanceolatis breviter petiolatis integris v. in parte superiore dentatis glanduloso-punctatis; capitulis multifloris parvis 3-4 ad apices ramorum corymbi multo- v. pauciramosi terminalis v. pseudo-terminalis paniculati sessilibus v. subsessilibus; phyllariis extimis squamiformibus apiculatis, intimis linearibus subscariosis; antheris obtusis; stylo indiviso; acheniis pilis adscendentibus vestitis; pappo squamiformi.

Suffrutex parvus glaber ramulis nigris striatis glutinosis. *Folia* lanceolata v. oblanceolata acuta 2–2½ poll. longa ½–⅓ poll. lata interdum 4½ poll. longa 3¼ poll. lata sæpe obliqua infra gradatim in petiolum brevem attenuata integra v. supra medium remote dentata coriacea v. tenuiter coriacea glabra glandulis pellucidis punctata et plus minusve glutinoso-nitida v. opaca, juniora nigro-nitida agglutinata. *Capitula* multiflora parva ¼ poll. diam. 3–4 ad apices pedunculorum corymbi paniculati pseudoterminalis multo v. pauciramosi 1 v. interdum 4 poll. diam. sessiles v. subsessiles, corymbi rami ultimi glutinosi validi striati sæpe complanati bracteolis squamiformis paucis suffulti. *Flores* ♂ pauciores. *Phyllaria* multiseriata adpressa concava, extima brevissima squamiformia apiculata extusque glanduloso-puberula, interiora gradatim majora angustiora minusque glandulosa, omnia acuta carinata marginibusque nudis fimbriato-ciliatis, intima straminea linearia versus apicem angustata. *Receptaculum* angustum depressum vix foveolatum. *Flores* lilacini. *Corollæ* tubus infra medium incrassatus sursum parum ampliatus breviterque 5-dentatis. *Antheræ* ad medium exsertæ apicibus obtusis brevibus, caudis antheris triplobrevioribus. *Stylus* indivisus exsertus. *Achenia* angusta 4–5-costata, costis pallidioribus pilisque adscendentibus vestitis. *Pappus* uniseriatus squamiformis, squamis apice dilatatis barbellatis.

Socotra. On the Haghier range above Tamarida and Kischen. B.C.S. nn. 223, 616. Schweinf. n. 646.

Distrib. Endemic.

A small under-shrub, growing over all the hill regions of the island. The adult form of our species has a shortly branched habit with smallish leaves and small corymbs of heads. But we have from near Galonsir stout and rigid twigs with large leaves (n. 223), and Schweinfurth sends from Kischen like shoots with large corymbs. These are probably young twigs or adventitious ones.

The plant has quite the general appearance of a *Psiadia*, but its anthers keep it out of the genus. Amongst the species of *Pluchea*, its nearest alliance is probably with *P. Dioscoridis*, DC. (Prod. v. 450), a plant of tropical Africa and Arabia, which is usually puberulous but sometimes glabrous. The glutinous habit and small few-headed panicles of our plant separate it.

2. P. aromatica, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 838. Tab. XXXII.

Fruticosa aromatica; foliis lanceolatis v. elliptico-oblongis acutis petiolatis integris v. in parte superiore obscure dentato-serratis ciliatis glanduloso-scabridis; capitulis longe pedunculatis multifloris terminalibus v. axillaribus solitariis rarius in cymam dispositis; phyllariis extimis brevissimis glandulosis apice reflexis, intimis angustissimis glabris; antheris acuminatis; stylo bifido lobis complanatis; acheniis glabris; pappo squamiformi.

Frutex parvus aromaticus ramis inferne denudatis cicatricosis, superne foliosis fulvis denseque glandulis capitatis firmis vestitis. *Folia* lanceolata v. elliptico-oblonga acuta 2–3 poll. longa ½–1 poll. lata sæpe subobliqua basi in petiolum sæpe ½ poll. longum canaliculatum subamplexicauliter dilatatum angustata integra v. in parte superiore obscure dentato-serrata breviter ciliata glanduloso-scabrida coriacea glaucescentia nervis 3–5 primariis plus minusve conspicuis. *Capitula* multiflora $\frac{5}{12}$ poll. diam. terminalia solitaria ad apices ramorum axillarium rarius pedunculo communi bifido; pedunculi longi (1¼–1¾ poll.) validi plerumque paucis bracteolis foliaceis obsiti glanduloso-scabriduli striati sæpe angulati et sub capitulis dilatati. *Phyllaria* multoseriata appressa concava, extima breviora linearis-

oblonga obtusa v. subacuta carinata extus glanduloso-puberula apice reflexa intusque glandulosa, interiora gradatim longiora, intermedia vix glandulosa lineari-acuminata marginibusque liberis fimbriatis, intima angustissima linearia capilliformia straminea glabra. *Receptaculum* planum foveolatum. *Corollæ* tubus infra medium incrassatus supra subampliatus 5-dentatus, dentibus acutis marginibusque incrassatis. *Antheræ* apice acuminatæ breviter exsertæ, caudis antheris triplobrevioribus. *Stylus* bifidus exsertus, lobis complanatis subtus convexis glabris. *Achenia* 4–5-angulata glabra costisque intermediis 4–5. *Pappus* uniseriatus squamiformis, squamis apice dilatatis abruptis.

Nom. Vern. Keideh (B.C.S.). Kadi (Schweinf.).

Socotra. On the Haghier range south of Tamarida and above Kischen. B.C.S. n. 465. Schweinf. n. 631.

Distrib. Endemic.

A very beautiful, small, and strongly aromatic shrub of the higher parts of the Haghier hills.

It is quite a distinct form, with some affinity to the foregoing species, but easily distinguished by many characters. Its styles and achenes are those of *Blumea*, but its shrubby habit excludes it from that genus.

3. P. obovata, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 838. Tab. XXXIII.

Fruticosa aromatica sæpe procumbens; foliis obovatis v. obcuneatis v. oblanceolatis sessilibus integris v. in parte superiore dentatis glabris glanduloso-punctatis; capitulis breviter pedunculatis multifloris terminalibus v. axillaribus solitariis v. in 2–3-capitatas cymas dispositis; phyllariis exterioribus brevioribus glanduloso-lanato-puberulis erectis, interioribus angustissimis glabris; antheris obtusis; stylo bifido, lobis teretibus papillosis; acheniis costis pilis adscendentibus vestitis; pappo setiformi.

Frutex parvus aromaticus scopulorum multiramosus ramis sæpe procumbentibus lateque patentibus glanduloso-punctatis, juvenilibus brunneis. *Folia* sessilia obovata v. obcuneata interdum oblanceolata $\frac{2}{3}$–$1\frac{1}{2}$ poll. longa $\frac{1}{4}$–$\frac{1}{2}$ poll. lata nunc minora nunc majora obtusa sæpe mucronulata integra v. in parte superiore leviter dentata crasse-coriacea venulis prominulis glanduloso-punctatis supra striata. *Capitula* campanulata $\frac{1}{4}$ poll. diam. multiflora terminalia v. ad apices ramorum axillarium solitaria v. in 2-3-capitatas cymas disposita; pedunculi breves striati validi glanduloso-tomentelli paucis bracteolis parvis instructi sub capitulis alte 3–5-sulcati et multo dilatati. *Phyllaria* multiseriata, exteriorum duarum v. trium squamæ breviores lineari-oblongæ acutæ erectæ herbaceæ extus lanato-puberulæ glandulosæ, interiorum angustiores acuminatæ stramineæ glabræ sed ad margines liberos versus apicem sparse puberulæ. *Flores* lilacini, ♀ pauciores. *Corollæ* tubus sursum subampliatus breviter 5-dentatus, dentibus obtusis subtus puberulis. *Antheræ* apice subtruncatæ obtusæ ad medium v. longius exsertæ, caudis brevibus antheris $\frac{4}{5}$ brevioribus. *Stylus* bifidus, lobis teretibus papillosis longe exsertis. *Achenia* 4–5-angulata cum costis paucis intermediis angulis non pallidioribus pilis adscendentibus instructis. *Pappus* setiformis uniseriatus barbellatus.

Socotra. Only on the cliffs on the higher parts of Haghier. Especially about Kischen and Adona. B.C.S. n. 497. Schweinf. n. 764.

Distrib. Endemic.

Another very beautiful and strongly aromatic shrub. On the cliffs in the higher parts of the island its long spreading branches run along the crevices, sending up here and there from the glistening foliage short twigs with a few heads of lilac flowers. It is one of the prettiest plants we have from the island.

From the other Socotran species, as well as from all species of the genus, its habit, inflorescence, and flowers widely separate it. Its bifid style is somewhat exceptional in the genus.

7. ACHYROCLINE.

Achyrocline, Less. Syn. Comp. 332; Benth. et Hook. Gen. Pl. ii. 305.

A small genus of mostly woolly half shrubby plants, included in about twenty species. Mostly tropical American, but a few occur in tropical Africa and Madagascar. Both Socotran species are spread in tropical Africa.

1. **A. luzuloides,** Vatke in Œster. Bot. Zeitschr. xxv. (1875), 326, and in Linnæa xxxix. (1875), 489 (excl. appar. syn. *A. sclerochlæna,* Vatke); Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 340.

A. glumacea, Oliv. and Hiern, *loc. cit.*

Gnaphalium luzuloides, Schultz Bip. in herb. Schweinf. Nub. n. 397, and in Schweinf. Flor. Æthiop. 149.

Helichrysum glumaceum, DC. Prod. vi. 197; Ach. Rich. Tent. Flor. Abyss. i. 427.

Socotra. Very common. B.C.S. n. 227. Schweinf. n. 492. Nimmo.

Distrib. Nile Land, Upper Guinea, Somali Land.

This plant occurs abundantly on the plains, and is a species showing considerable variation. I accept the species as constituted by Vatke (*loc. cit.*), upon Schweinfurth's specimens and Schimper's Abyssinian plants (sect. ii. n. 762); but I include the Senegambian plant of Perottet, described by De Candolle, which Vatke excludes, on what grounds I cannot determine. A misleading misprint in Vatke's paper in Linnæa, makes *A. sclerochlæna,* a very different plant, appear as a synonym of this species.

Oliver and Hiern (*loc. cit.*) regard Schimper's Abyssinian plants as specifically distinct from Schweinfurth's Nubian ones, and under the name *A. glumaceus,* keep up the species described by Ach. Richard, and with it doubtfully associate De Candolle's plant. I cannot confirm the diagnosis. Though the plants have a somewhat different aspect of foliage, the glabrous achenes of the Abyssinian plant—the chief character for diagnosis—are not constant, and I have therefore reduced all the forms to one species.

The receptacle, described as naked in *A. luzuloides,* is not always so. Frequently it is conspicuously fimbrilliferous, and there are intermediate forms.

This is one of the plants sent home from Socotra by Nimmo.

2. **A. Schimperi,** Schultz Bip. in Herb. Schimp. Abyss. sect. i. n. 393; Oliv. and Hiern in Flor. Trop. Afr. iii. 340.

Nom. Vern. Néschas (Schweinf.).

Socotra. On the hills. B.C.S. n. 622. Schweinf. n. 542.

Distrib. Tropical Africa (Nile Land and Mozambique).

Our Socotran plants have leaves rather more obtuse than in the typical African forms.

8. HELICHRYSUM.

Helichrysum, Gärtn. Fruct. ii. 404; Benth. et Hook. Gen. Pl. ii. 309.

A very large genus of old world herbaceous or small shrubby plants occurring most abundantly in south Africa, the Mascarene Islands, and Australasia. It has a remarkable development in Socotra, no less than seven species being found, all of which are endemic, and one exhibits several varietal states.

1. **H. rosulatum,** Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 347. Tab. XXXIV., A.

Suffruticosum cæspitosum ramulis paucis brevibus adscendentibus; foliis 3–5-nerviis oblanceolatis v. spathulato-oblongis sessilibus; capitulis anguste campanulatis plurimis in capitula terminalia subglobosa aggregatis; phyllariis pauciseriatis; receptaculo nudo; acheniis glabris.

Herba perennis cæspitosa suffruticosa valida caulibus albis tomentosis terminalibus 1½–3 poll. altis adscendentibus teretibus. *Folia* sessilia basi ramorum aggregata ½–⅘ poll. longa ⅛–$\frac{3}{16}$ poll. lata suprema minora oblanceolata v. spathulato-oblonga obtusa subapiculata v. emarginata basi angustata coriacea glabra supra cum 3–5-venis depressis subtus adpresse velutina alba margine integra revoluta. *Capitula* anguste campanulata 6–7-flora ⅙ poll. longa sessilia plurima in capitulum subglobulare ½–⅔ poll. diam. basi foliatum aggregata. *Involucri* pauciseriati phyllariis apice purpurascentibus scariosis nervo medio subtus conspicuo viridi, interioribus linearibus paulum superne dilatatis obtusis glabris, exterioribus similibus minoribus extus sublanuginosis. *Flores* omnes ♀. *Receptaculum* nudum. *Achenia* fere glabra.

Nom. Vern. Nschass (B.C.S.). Néschas (Schweinf.).

Socotra. On the highest points of the Haghier range at an altitude over 4000 feet. B.C.S. n. 396. Schweinf. n. 705. Nimmo.

Distrib. Endemic.

This beautiful tufted and strongly aromatic plant I gathered on the Haghier range, nearly at the summit of one of the highest peaks on the island, just above Adona. Schweinfurth's specimens were from a very high point farther west. The plant is probably spread over the peaks. It is a striking form, with the leaves densely whitely velvety below, and with small globular heads on short stalks. The root-stock is long, tapered, and little branched.

This is another of the unique specimens in Kew Herbarium, labelled "shores of the Red Sea, D. Nimmo,"—and the specimens are the types upon which Oliver and Hiern (*loc. cit.*) founded the species. I have already (p. 26) given reasons for asserting that Nimmo's plants are Socotran, and this plant is then endemic on the island.

The very complete specimens we have brought home show that the leaves are not always "spathulate oblong obtuse emarginate" as described, but are usually oblanceolate and subapiculate, and the stems often attain a height of about three inches.

2. H. sphærocephalum, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 839.

Lignosum lanatum parvum a basi ramosum ramis diffusis compressis; foliis 5-nerviis obovatis, basalibus breviter petiolatis, superioribus subsessilibus; capitulis campanulatis 30–40-floris brevissime pedicellatis 20–25 in cymas globosas terminales solitarias glomeratis; phyllariis multiseriatis, interioribus in parte superiore niveo-petaloideis patentibus floribus longioribus glabris; receptaculo nudo; acheniis scabridulis.

Herba lignosa pedalis radice simplici caule a basi diffuse ramoso, ramis adscendentibus inferne glabrescentibus superne complanatis lateribus sulcatis lanatisque pilis facile deterso vestitis. *Folia* 5-nervia, basalia obovata in petiolum brevem attenuata 1–1¼ poll. longa ½ poll. lata acuta et subcuspidata margine obsolete crenata supra obscure subscabrida et arachnoidea infra albida et dense lanata, superiora obovata v. subelliptica subsessilia dense omnino lanata. *Capitula* late campanulata ¼ poll. longa 30–40-flora in cymas solitarias capitatas densas globosas terminales ⅔ poll. diam. glomerata (in quaque ad 25) brevissime pedicellata pedicellis dense lanatis. *Involucri* multiseriati, phyllariis interioribus 3–4-seriatis ⅛ poll. longis floribus longioribus ad apicem expansis obtusis sæpe subcrenulatis in parte triente superiore niveo-petaloideis inferne stramineis marginibusque scariosis glabris, exterioribus minoribus omnino scariosis late ovatis concavis plerumque obtusis lanatis. *Receptaculum* nudum. *Achenia* oblonga subteretia scabridula. *Pappi* setæ ad apices barbellatæ.

Socotra. On the higher parts of the Haghier hills. On Sicante peak especially abundant, at an altitude over 2500 feet. B.C.S. n. 79. Schweinf. n. 629.

Distrib. Endemic.

Another species of the hills, belonging to a section of the genus conspicuously developed at the Cape of Good Hope, but identical with no described form.

In favourable situations it forms a small, compact, branching, half herbaceous plant, with ascending branches ending in globular clusters of heads.

We have from dry unfavourable localities another series of specimens, which I take to be a starved form of this plant, the chief feature of difference from the foregoing type being its quasi-stoloniferous axes. The branches from the main stem at first have elongated internodes and are decumbent, but they do not root at the point where they touch the ground, but growth is there arrested, and the succeeding internodes are contracted at the same time that the branch

curves abruptly upwards, without, however, elongating to any extent. The lateral branches thus end, as it were, in rosulate tufts of leaves. In the axils of some of the leaves of these rosettes long leafy ascending virgate shoots develop, each of which has at its extremity a cluster of capitula. Sometimes they, in turn, become decumbent and produce rosulate leaf-tufts. The elongated portions of the twigs are brown-black in this form under the indumentum, the leaves are longer and narrower than in the type, and the globose clusters of capitula are larger with smaller individual heads. Whilst the characters are hardly specific, I think it is well to constitute this form a distinct variety. The following is a diagnosis :—

var. **sarmentosum**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 839.

Quasi-stoloniferum ramis lateralibus teretibus glabrescentibus fusco-nigris decumbentibus, parte terram tangente internodiis contractis abrupteque adscendente ramosque gerente in virgas elongatas ultime floriferas productos; foliis caulinis et basalibus ramorum adscendentium approximatis, cæteris remotis, oblanceolatis v. longe obovato-spathulatis 1½–2 poll. longis longe petiolatis basi subamplexicaulibus; capitulis 50–60 in cymis ¾ poll. diam. aggregatis 15–20-floris ⅙ poll. longis; phyllariis 2–3-seriatis, interioribus ⅐ poll. longis floribus brevioribus, in parte quarta superiore niveo-petaloideis, exterioribus late ovato-acutis.

Socotra. In dry localities. B.C.S. n. 691.

Distrib. Endemic.

3. **H. arachnoides**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 839.

Annuum parvulum ramosum plus minusve arachnoideo-lanatum; foliis remotis ellipticis, inferioribus petiolatis, superioribus subsessilibus; capitulis parvis 8–12-floris campanulatis brevissime pedicellatis 7–8 in cymas terminales (rarius axillares) congestas glomeratis; phyllariis biseriatis, interioribus ad apicem niveis post anthesin patentibus; receptaculo nudo; acheniis scabriusculis.

Annuum 6–7-pedale lanatum radice exili simplici caulibusque e collo plurimis diffusis pauciramosis basi glabrescentibus apice arachnoideo-lanatis. *Folia* remota elliptica obtusa sæpe mucronulata margine leviter crenato-sinuata membranacea plus minusve arachnoidea subtus pallidiora, inferiora ¾–1 poll. longa ⅓ poll. lata basi gradatim in petiolum longum sæpe laminæ æquilongum attenuata, superiora breviora subsessilia basi contracta. *Capitula* homogama parva 1½ lin. longa campanulata 8–12-flora 7–8 in cymam parvam congestam ¼ poll. diam. terminalem (nonnunquam 2–3 in axillarem) glomerata brevissime pedicellata, pedicellis $\frac{1}{12}$ poll. longis dense lanatis quoque folium singulum sessile sub capitulo gerente. *Involucrum* obligophyllum floribus longior phyllariis 2-seriatis, exterioribus brevioribus late ovatis acutis scariosis, interioribus linearibus v. apice expansis et per partem trientem petaloideis niveis post anthesin patentibus, parte inferna straminea marginibusque scariosis, omnibus plus minusve lanatis. *Receptaculum* nudum. *Achenia* elliptica v. oblonga teretia scabriuscula. *Pappi* setæ apicaliter dilatatæ barbellatæ.

Socotra. On the hills south-west from Galonsir. B.C.S. n. 197.

Distrib. Endemic.

A small herb, not uncommon in tufts along with *H. gracilipes*, O. and H.,

on the dry hill slopes. A distinct enough species, it belongs to the section *Leptorhiza* of the subgenus *Euhelichrysum*. This section is otherwise entirely confined to south Africa, and with several of the south African species our plant has close affinity. Possibly *H. micropoides*, DC. (Prod. vi. 170), a Cape Colony plant, is its nearest ally, but is distinguished by the sessile heads and the form of bracts. With *H. capillaceum*, Less. (Syn. Comp. 275), there is considerable resemblance.

4. **H. aciculare**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 839. Tab. XXXIV, B.

Suffruticosum ericæphylloideum procumbens v. cæspitosum glabrescens; capitulis obconoideis 40–50-floris breviter pedicellatis 3–5 ad apices pedunculorum solitariorum axillarium longorum breviter lanatorum dispositis; phyllariis glabris omnibus fulvo-stramineis; receptaculo nudo; acheniis puberulis.

Suffruticosa parva cum axe subterraneo lignoso longo ramisque procumbentibus v. cæspitosis foliis marcidis persistentibus dense vestitis. *Folia* anguste-linearia ericoidea v. revoluta acicularia que $\frac{2}{3}$ poll. longa baseis dilatatis imbricatis marginibusque membranaceis ad apices ramorum stellatim patentia saturate-viridia, inferiora marcida reflexa rigida nitida leviter punctulata, superiora pilis paucis lanatis floceosis basi vestita. *Capitula* obconoidea 40–50-flora $\frac{1}{3}$ poll. longa subsessilia v. brevissime pedicellata in 3–5-capitatas axillares solitarias longe pedunculatas cymas disposita, cymis plerumque 1–2 ad ramulum quemque; pedunculi 2–3 poll. longi erecti compressi sparsim floceoso-lanati phyllis paucis remotis parvis basi gibbosis v. subamplexicaulibus gradatim in phyllaria transeuntibus suffulti. *Involucrum* polyphyllum, phyllariis multi-(10)-seriatis glabris nitidis fulvo-stramineis marginibus scariosis, intimis linearibus v. apice subexpansis acutis, proximis subæquilongis, cæteris gradatim deorsum minoribus, extimis minutis ovato-acuminatis. *Receptaculum* nudum. *Flores* omnes ♀ regulares. *Achenia* minuta subteretia sparse puberula. *Pappus* basi scabridus apice subplumoso-barbellatus.

Socotra. On the tops of the Haghier hills, at an elevation over 2500 feet. B.C.S. n. 397. Schweinf. n. 561.

Distrib. Endemic.

Another very distinct species. It differs by its ericoid foliage from all tropical African species, and it has no very near affinity in similarly clad south African forms. Like the foregoing, it is only found on the highest parts of the island.

5. **H. Nimmoanum**, Oliv. and Hiern in Oliv. Flor. Trop, Afr. iii. 347. Tab. XXXV.

Suffruticosum plus minus albido-tomentellum; foliis breviter petiolatis anguste ellipticis v. ovatis; capitulis parvis oblongis 8–10-floris pedicellatis in corymbas terminales dispositis; phyllariis glabris stramineis; receptaculo nudo; acheniis minute glandulosis.

Suffrutex parvus ramosus ramis teretibus supra albido-tomentellis glabrescentibus 8 poll. longis v. longioribus. *Folia* breviter petiolata $\frac{1}{2}$–$1\frac{1}{4}$ poll. longa $\frac{1}{6}$–$\frac{1}{2}$ poll. lata anguste elliptica v. ovata subacuta v. subobtusa apiculata basi subangustata integra inconspicue pinnato-venia albido-tomentella præsertim in pagina inferiore. *Capitula* oblonga 8–10-flora $\frac{1}{5}$ poll. longa breviter pedicellata in corymbos terminales 1–$2\frac{1}{2}$ poll. diam. subdense ramosos disposita.

Involucri multiseriati (4–6), phyllariis imbricatis inæqualibus glabris stramineis, interioribus lineari-oblongis obtusis margine scariosis, exterioribus gradatim brevioribus ellipticis. *Flores* omnes ♀. *Receptaculum* nudum. *Achenia* oblonga minute glandulosa.

NOM. VERN. Chfah. (Schweinf.).

Socotra. On the higher slopes of Haghier. B.C.S. n. 432. Schweinf. n. 767. Nimmo.

DISTRIB. Endemic.

Another species hitherto only known from Dr Nimmo's fragmentary specimens, and described by Oliver and Hiern (*loc. cit.*). Like *H. rosulatum*, O. and H., it is found at high altitudes growing in sheltered spots, and it appears to be endemic in Socotra, and is very distinct from any known form. Our specimens show leaves generally more obtuse than those on Nimmo's plant.

6. H. suffruticosum, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 840. Tab. XXXVI.

Suffruticosum plus minus glanduloso-pubescens; foliis sessilibus, inferioribus cochleariformibus, superioribus panduriformibus; capitulis parvis campanulatis 20-floris pedicellatis in corymbos terminales dispositis; phyllariis glabris concoloribus fulvo-stramineis; receptaculo nudo; acheniis puberulis.

Suffrutex ramosus parvus ramulis juvenilibus compressis canaliculatisque fusco-pubescentibus. *Folia* inferiora ad basin ramulorum subapproximata cochleariformia v. subspathulata supra medium abrupte contracta v. deorsum gradatim attenuata basique paulum dilatata $1\frac{3}{4}$–$2\frac{1}{4}$ poll. longa, extremitate expanso elliptico v. ovato obtuso margine crenato $\frac{1}{2}$–1 poll. lato supra læte viridi sparse pubescente rugoso subtus venoso albido-lanuginoso, superiora amplexicaulia panduriforima $\frac{1}{2}$–$\frac{3}{4}$ poll. longa subtus pallidiora glanduloso-pubescentia, *Capitula* parva anguste campanulata 20-flora $\frac{1}{4}$ poll. longa in corymbos compositos terminales $\frac{1}{2}$ poll. diam. pedunculis glanduloso-pubescentibus disposita, pedicellis $\frac{1}{6}$ poll. longis. *Involucrum* oligophyllum, phyllariis multi-(5)-seriatis nitidis fulvo-stramineis marginibus scariosis glabris, intimis linearibus acutis, exterioribus gradatim minoribus, extimis lanceolatis brevibus. *Receptaculum* nudum. *Flores* omnes ♀ regulares albi. *Achenia* angusta sparse glanduloso-puberula. *Pappus* albus barbatus.

NOM. VERN. Sebenham (B.C.S.).

Socotra. On the higher parts of Haghier. B.C.S. n. 406. Schweinf. n. 628.

A very beautiful aromatic species. It is quite distinct from any known form. *H. Nimmoanum*, O. and H., which grows with it, is perhaps as near an ally as any other species.

7. H. gracilipes, Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 348. Tab. XXXVII.

Procumbens filiformiter stoloniferum plus minus albido-tomentellus; foliis caulinis ellipticis v. anguste obovatis subacutis v. subobtusis subsessilibus, radicalibus subspathulatis; capitulis campanulatis 10–40-floris pedunculatis in paniculos dispositis; phyllariis multiseriatis stramineis; receptaculo nudo; acheniis puberulis v. glabris.

Herba procumbens stolonifera basi rosulata ramis filiformibus teretibus cito glabrescentibus ½–1-pedalibus. *Folia* albido-tomentella subtus densius, mucronulata, caulinia remota elliptica v. lanceolata v. oblanceolata v. obovata subacuta v. subobtusa subsessilia v. in petiolum brevem attenuata ⅓–½ poll. longa ⅛–¼ poll. lata radicalia approximata subspathulata v. rotundata v. subcordata trinervia sæpe ¾ poll. lata in petiolum sæpe 1 poll. longum subalatum basique dilatatum gradatim v. abrupte attenuata. *Capitula* anguste v. late campanulata 10-40-flora ⅙–¼ poll. longa pauca ad pedicellos breves v. longos (½–3 poll.) glabratos sæpe capillares erectos v. arcuatos solitarios et terminales sessa, vel numerosa in paniculos laxos ramosissimos subtiles disposita. *Phyllaria* multiseriata straminea v. fusca, glabra v. albido-tomentella acuta, intima linearia v. subspathulata concoloria v. inferne incrassata nervoque medio viridi, exteriora gradatim minora sublinearia v. elliptica. *Receptaculum* nudum. *Flores* omnes ♀ exteriores sæpe irregulares. *Achenia* sparse puberula v. glabra. *Pappus* albus barbatus setis patentibus.

Socotra. Common on the hill slopes and also on the sea-shore. B.C.S. nn. 83, 238. Schweinf. nn. 307, 470, 762. Nimmo.

Distrib. Endemic.

A third species, known hitherto only by Dr Nimmo's specimens, and described by Oliver and Hiern (*loc. cit.*). As it occurs on Socotra, and it is abundant, it is very variable in habit, clothing, and size of parts. We have the following forms:—

a. genuinum. B.C.S. n. 83. Schweinf. n. 762.

The specimens most typical are those gathered by Schweinfurth at Wadi Kischen, altitude 1900–3000 feet. But his plants are more robust than those of Nimmo. We obtained plants on the Haghier range, above Tamarida, resembling closely the type, being less stout than Schweinfurth's, but the achenes are quite glabrous, not puberulous as described.

b. lanatum, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Dense lanatum, pedunculis brevibus, acheniis glabris.

Socotra. Shore near Tamarida. Schweinf. n. 327.

Schweinfurth's specimens, from the sea-shore near Tamarida, show a more woolly plant, and one with thicker leaves than usual. The woolliness is especially evident upon the involucre. The peduncles of the capitula are very short in this form, and the achenes are glabrous.

c. profusum, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Foliis submembranaceis, capitulis parvis paucifloris in paniculos ramosos dispositis, pedicellis erectis.

Socotra. Near Keregnigiti. Schweinf. n. 470.

A single specimen, sent by Schweinfurth, differs from the forms already mentioned in its erect, patent, and more slender character. The leaves are large and thin, almost membranaceous, and the capitula are arranged in much branched panicles, the ultimate peduncles being erect and very fine. The

flower heads are small, $\frac{1}{6}$ inch long, and contain very few—rarely 10—flowers, which Schweinfurth says are white.

d. **stoloniferum**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Stolonifera, capitulis majoribus multifloris solitariis, phyllariis exterioribus brevibus ovatis, interioribus longis spathulatis acutis.

Socotra. Hills south-west from Galonsir. B.C.S. 238. Nimmo.

This is the form we found most common on the hills south-west of Galonsir. It consists of a number of small rosulate herbs united by long delicate stolons, and sending up a few arcuate branches, each of which ends in a long (often 2–3 inches) thin peduncle supporting a solitary capitulum. The capitula are large, over $\frac{1}{4}$ inch long, 30–40-flowered, and with a many-leaved, many-rowed involucre, the outer phyllaries of which are short and ovate, the inner long spathulate and acute, with the narrowed lower part thickened and green-ribbed. They are only slightly woolly. This is the most divergent from the type, but though the involucre and the size of the heads, with the long peduncles, are very marked characters, they are hardly specific.

9. PULICARIA.

Pulicaria, Gärtn. Fruct. ii. 461, t. 173, f. 7.; Benth. et Hook. Gen. Pl. ii. 335.

An old world genus of twenty-five to thirty herbaceous or shrubby species, occurring in Europe, Africa, and the eastern parts of Asia. One species occurs at the Cape of Good Hope, but the Mediterranean region is their centre. The three Socotran species are endemic.

1. P. diversifolia, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 840.

Herba scabrido-hirsuta ramis in capitula solitaria abeuntibus; foliis basalibus plerumque ab formis obcuneatis ad oblanceolatas basique gradatim attenuatis interdum ellipticis v. oblongo-ellipticis basique abrupte contractis infra integris supra grosse dentato-serratis v. crenatis acutis v. obtusis, petiolo longo anguste alato subamplexicauli, caulinibus angustioribus; capitulis hemisphæricis multifloris radiatis; phyllariis subæqualibus lineari-acuminatis glanduloso-hirsutis; acheniis 7–8-costatis hirsutis; pappo exteriore coroniformi; setis interioribus 10.

Herba pedalis scabrido-hirsuta a basi ramosa, ramis striatis adscendentibus bipartim ramosis, quoque in capitulum solitarium abeunte. *Folia* glauco-canescentia subcrassa, basalia circa $2\frac{1}{2}$–3 poll. longa v. $\frac{1}{2}$–1 poll. sed nunc multo majora nunc minora plerumque obcuneata v. subobovata elliptico-oblonga basique integra late cuneata v. abrupte in petiolum alatum longum frequenter lamina longiorem supra paulum convexum subamplexicaulem axillaque villosa attenuata in parte apicali grosse dentato-serrata v. obscure crenato-dentata acuta v. obtusa nerviis primariis 2–4 plerumque versus apicem laminæ marginibus parallelibus currentibus, caulinia angustiora oblanceolata v. lineari-lanceolata, suprema sæpe linearia sessilia. *Capitula* multiflora hemisphærica radiata $\frac{5}{12}$ poll. diam. ad extremitates pedunculorum longorum (sæpa $\frac{1}{2}$-ped.) scabrido-puberulorum solitaria. *Phyllaria* pauci-

(3–5)-seriata imbricata lineari-acuminata carinata fere subæqualia paulum hirsuta et glandulis capitatis extus instructa, interiora marginibus scariosis, exteriora pauca paulum breviora subherbacea sæpe oblongo-acuminata apiceque reflexa. *Receptaculum* foveolatum $\frac{1}{24}$–$\frac{1}{12}$ poll. diam. convexum. *Radii* flores eos disci triente excedentes, ligula tubo longiore 3–4-dentata. *Antheræ* obtusæ, caudis filiformibus connatis. *Styli* lobi subspathulati obtusi extus papillosi. *Achenia* 7–8-costata pilis adscendentibus instructa subteretia. *Pappus* exterior coroniformis acuminato-fimbriatus, interioris setæ 10 parum sursum expansæ scabridulo-serrulatæ v. barbellatæ.

Socotra. Very common on the plains. B.C.S. nn. 119, 600. Schweinf. n. 453.

Distrib. Endemic.

One of the commonest weeds on the island, and at the same time an extremely variable plant, as its description makes evident. As in the case of so many other plants, there is a form from dry stony localities, and one from sheltered favourable localities, and between them we get gradations. The plant in the former situations has a small compact habit, with lateral branches often contracted, and leaves altogether smaller, thicker, deeply cut, and hirsute, and with dense villous tufts around the buds in their axils. The stalks of the capitula, too, are very short. Plants from suitable spots are more luxuriant, the branches are longer and tend to trail, the leaves are thinner, more developed at the margins, and less hairy, whilst the flower peduncles extend to a great length.

The nearest ally of our plant is perhaps *P. petiolaris*, Jaub. et Spach (Ill. Pl. Or. iv. 69, t. 344), a plant of Abyssinia and Nubia, and perhaps of Somali Land. But the scabrid hairy clothing, the larger head, and the flowers of our plant distinguish it.

In Kew Herbarium are two specimens, one collected by Hildebrandt in Somali Land (n. 1435), the other plant from the vicinity of Aden, sent by Hunter (n. 122), which are probably one and the same species, and with which our plant has much resemblance,—not quite amounting to identity, for the achenes in these specimens are longer, narrower, and fewer ribbed, and the outer pappus forms a shortly dentate cup,—but the habit and foliage are much alike. The Somali Land and Arabian specimens are small and insufficient for complete comparison, but it is interesting to note the likeness. For whether our plant be identical with these or not, there can be little doubt that a species so abundant and widely scattered over the island as this is, will turn up on the adjacent mainland when that is explored.

2. **P. stephanocarpa**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 840. Tab. XXXVIII.

Fructicosa tortuose ramosissima glaucescens; foliis crassis velutinis spathulatis v. cochleariformibus plus minusve 3–5-rotundato-lobatis persistentibus; capitulis homogamis solitariis axillaribus breviter pedunculatis; phyllariis exterioribus gradatim minoribus; antherarum caudis elongatis connatis simplicibus; acheniis angulatis 10-costatis corona

apicali setarum sub pappo suffultis; pappo exteriore cupuliformi segmentis paleaceis interioribus setis complanatis.

Suffrutex erectus glaucescens tortuose et intricato-ramosissimus 1–2-pedalis ramis juvenilibus pubescentibus glandulisque copiose sub pilis suffultis proventu cinereis glabratis. *Folia* spathulata v. cochleariformia $\frac{1}{3}$–$\frac{5}{6}$ poll. longa $\frac{1}{8}$–$\frac{1}{3}$ poll. lata subtruncata plus minusve alte palmatim 3–5-lobata lobis rotundatis integris sæpe solum emarginata parte angusta inferiore canaliculata subamplexicauli et subdecurrente partem expansam superiorem exedente versus basin abrupte v cuneato-attenuata margine revoluta crassa persistentia velutina axillis villosis. *Capitula* multiflora homogama solitaria axillaria $\frac{1}{4}$ poll. diam. vix campanulata, pedicellis $\frac{1}{8}$–$\frac{3}{8}$ poll. longis. *Phyllaria* 4–5-seriata parum carinata extus pilis adpressis canescentia subciliata, interiora lineari-subulata marginibus parum scariosis, exteriora gradatim minora subherbacea sæpe rubro-punctata. *Receptaculum* nonalveolatum areolatum papillosum convexum. *Corolla* flava, tubo 5-dentato sursum ampliato. *Antherarum* apices acuminatæ, caudis elongatis simplicibus connatis. *Styli* lobi elongato-lineares leviter papillosi apice rotundati. *Achenia* angulosa 10-costata ad apicem corona setarum brevium albarum pappo simili instructa cæteroquin glabra. *Pappus* exterior brevior cupulæformis alte multifidus paleaceo-fimbriatus, interioris setæ subcomplanatæ barbellatæ.

Nom. Vern. Dhaël (Schweinf.).

Socotra. The commonest plant of the plains at Galonsir and Nogad. B.C.S. n. 14. Schweinf. n. 252.

Distrib. Endemic.

Amongst the true *Inuleæ*, to which tribe our Socotran plant undoubtedly belongs, I have had some difficulty in finding a genus to which it might be referred. For whilst with none of them do its characters entirely agree, yet it possesses some of the features of several closely-allied genera. At one time I considered that it might form the type of a new genus, for the achenes are very different from those in any in this tribe, but for the present I am content to place it in *Pulicaria*.

From the technical characters of the genus it diverges in some particulars. The heads are homogamous, which is not a character of *Pulicaria*, although sometimes they are disciform; the anther-tails are connate in pairs, a feature unknown, so far as I am aware, in *Pulicaria*, except in the Socotran species just described,—*P. diversifolia*,—and the achenes are very strongly angulate, with prominent ribs, not terete as in typical species. In its pappus, too, it differs, for the inner setæ are somewhat flattened. In this latter character, as well as in that of the shrubby habit, connecting links with typical *Pulicariæ* are supplied by those half shrubby forms from the desert plains of the east, originally described by Boissier (Diagn. i. vi. 76) under *Pterochæta* [subsequently changed to *Platychæta* (Diagn. i. xi. 5, and Flor. Orient. iii. 207)], on account of the flattening of the pappus, but now referred by Bentham and Hooker to *Pulicaria*. T. Anderson's Aden plant, *Vartheimia arabica* (T. Anders. in Journ. Linn. Soc. v. (1866), Suppl. 23), is one of this group.

Pegolettia differs technically from *Pulicaria* in its homogamous heads, anther-tails setaceously branched, and in the free paleæ of the outer pappus. In the first of these points our plant agrees with *Pegolettia*, but not in the others. It further differs from *Pegolettia* in its achenes in the same degree as it does from *Pulicaria*; also, *Pegolettia* wants the flattening of the setæ of the inner pappus. In general facies, too, species of *Pegolettia* are very different.

In *Grantia* are included some south Persian species which our plant resembles a good deal in general characters. But the absence of the foliaceous outer involucral bracts, so striking a feature in this genus, along with the connate paleæ of the outer pappus, and the achenes separate it readily.

Another allied genus of this region, *Iphiona*, might lay some claim to the plant, but it has setaceous outer pappus.

In selecting *Pulicaria* as the genus for this plant, I have been influenced by its possessing a preponderance of conformable characters, but the species is decidedly an aberrant one.

We know this plant now only as endemic in Socotra, but its distribution and profusion there are such as to forbid one regarding it as a plant that is peculiar to the island. When the adjacent shores of the mainland are carefully examined, I have little doubt this plant will be found, and further exploration of these regions will also certainly bring to our knowledge many forms which will throw light upon the limits of these nearly allied Inuleæan genera. With such knowledge it will then be possible to determine more precisely the true position of this very interesting plant. Should it be the type of a new genus, or of a section of another genus, its chief claim for recognition will rest on the form and pattern of its achenes.

3. **P. vieræoides**, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 840. Tab. XXXIX.

Fruticosa cinerea habitu Vierææ; foliis obovatis crasse coriaceis glandulis instructis et arachnoideis; capitulis radiatis solitariis pseudo-terminalibus longe pedunculatis; phyllariis pauciseriatis glanduloso-puberulis exterioribus gradatim minoribus extimisque sæpe foliaceis magnis; antherarum caudis elongatis simplicibus connatis; acheniis subteretibus 10-costatis apice hirsutis; pappo exteriore cupuliformi paleaceo-lacero, interioribus setis complanatis.

Frutex ramosus habitu Vierææ v. Psiadiæ ramulis cicatricosis terminalibus glanduloso-puberulis brunneis interdum arachnoideis. *Folia* obovata v. oblanceolata $1\frac{3}{4}$–$2\frac{1}{2}$ poll. longa $1\frac{1}{2}$–$\frac{3}{4}$ poll. lata v. minora acuta v. obtusa basi gradatim in petiolum anguste alatum amplexicaulem axilloque villoso attenuata margine obscure dentato-serrata parum revoluta crasse coriacea nervis prominulis plus minusve arachnoidea sæpius juvenilia compacte albido-lanata sub pilis copiose glandulosa. *Capitula* magna multiflora $\frac{2}{3}$ poll. diam. radiata solitaria pseudoterminalia versus extremitatem ramorum inter folia expansa, pedunculis 2 poll. longis ultra folia projectis striatis glanduloso-puberulis sæpe 1- v. pluribracteatis. *Phyllaria* 3–4-seriata extus glandulis stipitatis instructa pilisque longis paucis arachnoideis vestita, interiora linearia acuminata marginibus scariosis, exteriora herbacea

gradatim minora linearia obtusa v. cuspidata sed extima sæpe subspathulata foliacea intimisque æquilonga v. longiora. *Receptaculum* convexiusculum subalveolatum $\frac{1}{6}$ poll. diam. *Corolla* flava ligula tridentata. *Antherarum* apices anguste acuta, caudis elongatis simplicibus binis connatis. *Styli* lobi longi lineares obtusi papillosi. *Achenia* subteretia 10-costata versus apicem pilis brevibus adpressis vestita. *Pappi* exterioris paleæ in cupulam parvam laceram connatæ, interioris setæ 12–18 complanatæ serrulatæ.

Socotra. On the Haghier range south of Tamarida, at an elevation over 2000 feet. B.C.S. nn. 402, 481.

Distrib. Endemic.

Another very remarkable Inuloid species. It is by no means common on Socotra. We have it only from the Sicante range of peaks.

The plant has all the appearance of a *Psiadia*, from which genus, however, its anthers thoroughly exclude it. It also resembles the monotypic Canary Island *Vieræa*. But its incorporation in that genus is forbidden by the achenes, and especially by its pappus. Technically there is no character separating it from *Pulicaria*, but the habit is quite foreign to that genus, and it is a very abnormal species.

10. SIEGESBECKIA.

Siegesbeckia, Linn. Gen. n. 973; Benth. et Hook. Gen. Pl. ii. 359.

A small genus of three species of herbs, one being peculiar to Nile Land, the others are cosmopolitan in tropical and subtropical regions.

S. orientalis, Linn. Sp. 1269; DC. Prod. v. 495; Boiss. Flor. Orient. iii. 250; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 372; Hook. fil. Flor. Brit. Ind. iii. 304; Wight Ic. t. 1103.

Socotra. On the hills near Ray village and elsewhere. B.C.S. n. 623. Schweinf. n. 597.

Distrib. Common in the tropics.

11. ECLIPTA.

Eclipta, Linn. Mant. 157; Benth. et Hook. Gen. Pl. ii. 361.

A small genus of herbs, embracing an Australian, a South American, and a cosmopolitan tropical weed.

E. alba, Hassk. Pl. Jav. Rar. 528; Boiss. Flor. Orient. iii. 249; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 373; Hook. fil. Flor. Brit. Ind. iii. 304.

E. erecta, Lamk. Illustr. iii. 265, t. 687.

Socotra. Near Tamarida. B.C.S. n. 224. Schweinf. n. 355.

Distrib. Cosmopolitan in warm regions.

The Socotran plant is the prostrate form of this widely-spread weed.

12. BLAINVILLEA.

Blainvillea, Cass. in Dict. Sc. Nat. xxix. (1823), 493; Benth. et Hook. Gen. Pl. ii. 369.

A small genus of about six species of erect herbs widely spread in the tropics of both hemispheres.

B. rhomboidea, Cass. in Dict. Sc. Nat. xxix. (1823), 494; DC. Prod. v. 492; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 375.

B. Gayana, Cass. in Dict. Sc. Nat. xlvii. (1827), 90; Oliv. and Hiern *loc. cit.*
B. latifolia, DC. in Wight Contrib. (1834), 17; Hook. fil. Flor. Brit. Ind. iii. 305.

Socotra. Not uncommon. B.C.S. n. 596. Schweinf. n. 763.

DISTRIB. Round the world in the tropics.

Cassini's two species, it would appear, are, as Bentham and Hooker (*loc. cit.*) point out, forms of one widely-spread species, to which also De Candolle's plant is justly referred by Hooker. The size and margination of the leaves, length of peduncle, size and feature of the capitula, relied upon by Cassini and De Candolle, are very variable, and not of specific value. Oliver and Hiern (*loc. cit.*) remark that tropical African specimens referred by them to *B. rhomboidea*, Cass., "differ from a type specimen that we have seen and from Brazilian ones in the tubercles of the achenes; the Zanzibar specimen is sparingly tubercled; an Arabian one is also tubercled." In this character there is great variation. From Socotra alone we have specimens showing extremely smooth or only slightly foveolate achenes, whilst in others the surface is glossy and strongly tuberculate and strigose, and there are many intermediate forms.

13. BIDENS.

Bidens, Linn. Gen. n. 932; Benth. et Hook. Gen. Pl. ii. 387.

A large genus of chiefly American herbs. Some are cosmopolitan.

B. pilosa, Linn. Sp. 1166; DC. Prod. v. 597; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 392; Hook. fil. Flor. Brit. Ind. iii. 309.

NOM. VERN. Mdanhi or Heddanin (Schweinf.).

Socotra. Common. B.C.S. n. 715. Schweinf. nn. 296, 575.

DISTRIB. A common weed in warm countries. Schweinfurth sends a form of this, with deeply trifid leaves and incised segments, from Tamarida (n. 296), for which he gives as the vernacular name "Heddanin."

14. SENECIO.

Senecio, Linn. Gen. n. 953; Benth. et Hook. Gen. Pl. ii. 446.

A very vast cosmopolitan genus. The section *Kleinia*, to which our Socotran species belongs, embracing some twenty species, with few exceptions

south African, is distinguished from the chief type of the genus by the fleshy glabrous habit, the homogamous flower heads, and the style branches usually conical, often penicellate.

S. (Kleinia) Scotti, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 841. Tab. XL.

Perennis erectus glaber succulentus multo-ramosus, caulibus subteretibus; foliis remotis parvis linearibus; capitulis subcylindricis homogamis 6–8-floris ad extremitates ramorum solitariis v. 2–3 in cymas breviter pedunculatas aggregatis; phyllariis 5–6 linearibus cuspidatis floribus dimidio brevioribus; receptaculo nudo; acheniis subteretibus 10-costatis brevibus rigidis setulis intercostalibus; pappo corollæ vix æquilongo.

Perennis erectus rigidus glaber succulentus 1–2-pedalis multiramosus, caulibus ramisque subteretibus. *Folia* sessilia remota linearia obtusa v. acuta $\frac{1}{4}$–$\frac{1}{3}$ poll. longa succulenta basi incrassata et sublignosa supra basin leviter constricta mox decidua. *Capitula* pauca homogama 6–8-flora subcylindrica angusta $\frac{1}{2}$ poll. longa ad extremitates ramorum solitaria v. in 2–3-capitatas cymas disposita, pedunculis validis $\frac{1}{6}$ poll. longis sæpe 1-v. ∞-bracteatis. *Involucri* squamæ extimæ paucæ 1–2 subulatæ v. omnes obsoletæ; phyllaria 5–6 linearia $\frac{1}{4}$–$\frac{1}{3}$ poll. longa cuspidata rigida costata marginata glabra sed cuspide sæpe brevissime puberulo-ciliata floribus dimidio breviora. *Receptaculum* alveolatum nudum. *Corolla* $\frac{1}{2}$ poll. longa, fauce ampliato, limbi lobis extus leviter puberulis. *Styli* lobi apiculati. *Achænia* subteretia angusta 10-costata, costis subpunctulatis, intervallis breviter rigide setulosis. *Pappus* corollæ vix æquilongus.

Socotra. On the Haghier range above Tamarida, at an elevation over 2500 feet. B.C.S. n. 446. Schweinf. (?)

Distrib. Endemic.

This is, I expect, a rare plant on the island. It was found by Scott only in one locality on the granite peaks.

It is quite a distinct species, and of considerable interest, belonging as it does to a section of the genus almost exclusively south African. Its nearest ally is *S.* (*Kleinia*) *longiflorus,* Oliv. and Hiern (in Oliv. Flor. Trop. Afr. iii. 421), a south African plant, found also in Abyssinia and some parts of tropical Africa. Whilst resembling it closely, our plant is easily distinguished by the subterete stems and the smaller and fewer flower heads.

Schweinfurth sends specimens, without flower, of a plant he has cultivated at Cairo from Socotran stock, which he supposes to be a *Notonia.* It may be our *Senecio Scotti,* but the leaves are more obtuse and broader.

15. EURYOPS.

Euryops, Cass. in Bull. Philom. 1818, and in Dict. Sc. Nat. xvi. (1820), 49; Benth. et Hook. Gen. Pl. ii. 452.

A genus of shrubs or half-shrubby plants, included in about thirty species, mainly located at the Cape of Good Hope. One has a limited Arabian distribution and another is found in Nile Land, but these are doubtfully distinct.

E. socotranus, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 841. Tab. XLI.

Suffrutex 3-pedalis glaber bipartim ramosus ramis cicatricosis; foliis sessilibus arcte trifidis segmentis linearibus obtusis; pedunculis foliis vix æquilongis; phyllariis 8 connatis; acheniis hispidis.

Suffrutex 3-pedalis glaber bipartim ramosus ramis brevibus foliorum baseis persistentibus tessalato-cicatricosis. *Folia* sessilia ad apices ramorum confertissima elongata 1½–2 poll. longa per partem trientem trifida segmentis linearibus obtusis infra versus basim attenuata *Pedunculi* teretes tenues in axillis superioribus solitarii monocephali foliis vix longiores in corymbum terminalem foliosum approximati straminei. *Capitula* hemisphærica ¼ poll. diam. *Phyllaria* 8 lata acuta ad medium connata. *Receptaculum* foveolatum dentatum. *Flores* radii ligula 2¼ poll. longa elliptica truncata disci involucro subæquilonga. *Achenia* hispida.

Socotra. On the higher regions of Haghier. B.C.S. n. 401. Schweinf. n. 673. Hunter n. 11.

Distrib. Endemic.

An interesting indigenous species, distinguished by its trifid leaves, few-leaved involucre, and hispid achenes, from *E. arabicus*, Steud. (in herb. Schimp. Arab. n. 852; Jaub. et Spach Ill. Pl. Or. iv. 88, tt. 355, 356), and from *E. pinifolius*, Ach. Rich. (Tent. Flor. Abyss. i. 445, t. 60), the only two species,—and they are doubtfully distinct,—which are found beyond the Cape of Good Hope. Possibly its nearest ally is *E. trifurcatus*, Cass. (Harv. and Sond. Flor. Cap. iii. 411), in which, however, the flower heads are larger, the phyllaries more numerous, and the achenes are villous.

16. TRIPTERIS.

Tripteris, Less. in Linnæa vi. (1831), 95; Benth. et Hook. Gen. Pl. ii. 455.

Essentially a Cape of Good Hope genus of about thirty herbaceous species. One is, however, found in south tropical Africa, and two occur in north tropical Africa, one of which extends to Socotra.

T. Lordii, Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 424,
var. **racemosa,** Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

A basi multiramosa; foliis plerumque oblanceolatis angustis; capitulis minoribus ¼ poll. longis; involucri bracteis oblongo-ellipticis acutis ⅛ poll. longis; floribus flavis radii ligula ⅛ poll. longa; acheniis ⅓ poll. longis.

Socotra. Common near Galonsir and Tamarida. B.C.S. n. 74. Schweinf. n. 443.

Distrib. Of the species—Upper Nubia. Of the variety—endemic.

The type of this species is represented in Kew Herbarium by a few specimens collected by Lord at Hor Tamanib. Our plant differs in being a more freely branched form, with much smaller flowers and fruit, and I have made it a distinct variety. On Lord's ticket is the remark—"blue flowers, very showy." The appearance of the dried flowers belies this, and I am pretty certain they must be yellow, as are those of our Socotran plant.

17. VOLUTARELLA.

Volutarella, Cass. in Bull. Philom. 1816, and in Dict. Sc. Nat. lviii. (1829), 451; Benth. et Hook. Gen. Pl. ii. 476.

A genus of a few herbaceous species distributed in northern Africa, south Europe, and western Asia. One species extends to India.

V. Lippii, Cass. in Dict. Sc. Nat. xliv. (1826), 39; Benth. et Hook. Gen. Pl. ii. 476.

Amberboa Lippii, DC. Prod. vi. 559; Boiss. Flor. Orient. iii. 606.
Centaurea Lippii, Linn. Sp. 1286; Schkuhr Handb. t. 261.

Socotra. Near Tamarida. B.C.S. n. 303.

DISTRIB. From the Canary Islands and south Spain, through north Africa to Arabia.

I have hesitated to make a new species of the Socotran plant, although it differs in some characters from the typical *V. Lippii*, as our material from Socotra consists of only one specimen, gathered on the plains near Tamarida. This has very woolly cobwebbed stems, and altogether a softer habit than the African and Arabian plants. The heads, too, are narrower with less scarious cusps to the phyllaries, and the corolla tube is not nearly so villous. It may be noted that the type is a somewhat variable plant.

18. DICOMA.

Dicoma, Cass. in Bull. Philom. 1817, and in Dict. Sc. Nat. xiii. (1819); 194; Benth. et Hook. Gen. Pl. ii. 492.

A genus of about eighteen species of small rigid woody plants, having their headquarters in south Africa; some four species are spread through tropical Africa, and one of them is also distributed in the Indian peninsula. One Socotran species is endemic, the other is an African and western Asiatic form.

1. D. tomentosa, Cass. in Bull. Philom. 1818, and in Dict. Sc. Nat. xiii. (1819), 195; DC. Prod. vii. 36; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 443; Hook. fil. Flor. Brit. Ind. iii. 387.

D. lanuginosa, DC. Prod. vii. 36; Wight Ic. t. 1140.

Socotra. On Haghier near Tamarida. B.C.S. n. 228. Schweinf. n. 438.

DISTRIB. Tropical Africa, Indian peninsula, and south-west Asia. Widely spread.

A not common plant on Socotra.

2. D. cana, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 841. Tab. XLII.

Prostrata cano-tomentosa lignosa; foliis linearibus obtusis sessilibus crassis persistentibus; capitulis solitariis pseudo-terminalibus subsessilibus paucifloris homogamis discoideis; phyllariis pallidis glabris, intimis membranaceis, exterioribus gradatim minoribus rigidis subulato-punctatis; receptaculo alveolato; acheniis dense setosis; pappi setis conformibus serrulato-barbellatis.

Prostrata nana subcæspitosa lignosa cano-tomentosa, ramulis angulis proventu glabratis. *Folia* sessilia linearia obtusa $\frac{1}{2}$ poll. longa $\frac{1}{16}$ poll. lata integra supra canaliculata crassa persistentia. *Capitula* plerumque 7-flora homogama discoidea subsessilia solitaria pseudo-terminalia. *Phyllaria* imbricata 4–5-seriata pallida glabra, intima membranacea oblongo-linearia subacuminata albida basique intus brunnea $\frac{1}{2}$ poll. longa patentia, exteriora gradatim minora rigida anguste marginata late ovata leviter concava apice subulato-pungentia acuminata, straminea. *Receptaculum* concavum alveolatum nudum. *Corolla* $\frac{5}{6}$ poll. longa, lobis lineari-acutis reflexis extus pilis adpressis paucis vestitis. *Antherarum* apices acuminati, caudis setiformibus copiose pilosis loculis æquilongis. *Achenia* dense setosa $\frac{1}{12}$ poll. longa. *Pappus* multiseriatus setis conformibus complanatis basi latioribus serrulato-barbellatis acheniis multo-longioribus sed corollæ æquilongis.

Socotra. On the cliffs overhanging the shore on the south-west of Galonsir, at an elevation over 1500 feet. B.C.S. n. 157. Hunter.

Distrib. Endemic.

A striking new species, easily diagnosed by its habit and facies from all hitherto described. Its position in the genus is in the vicinity of the Cape of Good Hope species *D. diacanthoides*, Less. (in Linnæa v. (1830), 279). It is a plant of the limestone regions in Socotra. We only found it in one locality, but there in profusion.

19. LACTUCA.

Lactuca, Linn. Gen. n. 909; Benth. et Hook. Gen. Pl. ii. 524.

A large genus of herbs widely spread in the old world, and also found in North America. Both the Socotran species are endemic.

1. L. rhynchocarpa, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 841.

Herba tenuis glabra depressa v. a basi ramosa caulibusque suberectis; foliis glaucis lyrato-pinnatipartitis, segmento terminali oblongo-acuto v. rotundato v. panduriformi subaculeato-dentato, segmentis inferioribus gradatim minoribus runcinatis, radicalibus breviter petiolatis subamplexicaulibus, caulinibus sessilibus; capitulis parvis 10–12-floris $\frac{2}{5}$ poll. longis oppositifoliis in laxos pseudo-racemos dispositis; phyllariis intimis ensiformibus obtusis post anthesin vix basi incrassatis, extimis parvis ovato-acutis; acheniis vix compressis 4-gonis costis 1–2 in quoque facie conspicuis, infra angustatis, apice in rostrum longum abrupte productis; pappi setis serrulatis.

Herba perennis depressa v. suberecta glabra a basi multiramosa, radice tenui, caulibus subadscendentibus v. decumbentibus tenuibus striatis. *Folia* lyrato-pinnatipartita, lobo terminali oblongo-acuto v. rotundato v. panduriformi setoso-dentato, lobis inferioribus gradatim minoribus runcinatis acutis v. obtusis dentatis sæpe setulosis, radicalia $1\frac{1}{2}$–2 poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata breviter petiolata petiolo subamplexicauli, caulinia sessilia subauriculata, suprema sæpe lineari-acuta v. cuspidata integra, glauca crassiuscula. *Capitula* parva 10–12-flora $\frac{2}{5}$ poll. longa. oppositifolia solitaria ad pedunculos $\frac{3}{4}$–$1\frac{1}{2}$ poll. longos tenues bracteolis integris subulatis minutis instructos. *Phyllaria* intima 6–7 ensiformia obtusa post anthesin parum acuta et basi incrassata; calyculi squamæ paucæ parvæ herbaceæ angustæ ovatæ acutæ. *Receptaculum* nudum $\frac{1}{16}$ poll. diam. *Corollæ* ligula 5-dentata. *Antheræ* basi obtuse productæ. *Styli* lobi apice conici. *Achenia*

leviter compressa 4-gona costis 1–2 in quoque facie intermedio infra angustata angulis costisque rugosis et subtiliter strigosis superne in rostrum longum disco apicali pappifero abrupte producta, rostro $\frac{1}{8}$ poll. longo achenii corpore $\frac{1}{10}$ poll. longo longiore. *Pappi* setæ serrulatæ basi connatæ albæ.

Socotra. On the plains. B.C.S. nn. 217, 594. Schweinf. n. 398.

Distrib. Endemic.

The achenes in this species are so very slightly compressed, that I formerly referred it to the *Barkhausia* section of *Crepis*, wherein it finds an ally in *C. bursifolia*, Linn. (Sp. 1131), a south European plant. But it probably belongs more naturally to *Lactuca*. I have not succeeded in identifying our plant with any described species, but in Kew Herbarium are a number of unnamed eastern specimens, with several of which it claims near relationship.

2. **L. crassifolia**, Balf. fil. in Proc. Roy. Soc. Edin. xi (1882), 842.

Herba perennis glabra glauca valida divaricatim breviter ramosa; foliis crassiusculis lyrato-pinnatifidis, segmento terminali oblongo-acuto v. obtuso calloso-dentato et sæpe inæqualiter lobato, lobis inferioribus irregulariter ad basin minoribus, radicalibus vix petiolatis amplexicaulibus, caulinibus sessilibus auriculatis; capitulis 20-floris $\frac{1}{4}$–$\frac{1}{2}$ poll. longis oppositifoliis in pseudo-racemos breves dispositis; phyllariis intimis æqualibus linearibus marginatis, extimis paucis late ovatis minoribus; acheniis basi truncatis in rostrum breve pallidum productis; setis pappi scabridulis acheniis æquilongis.

Herba perennis glabra glauca 3–4 poll. alta, radice longo recto lignoso valido, a collo ramosa caulibus validis erectis, ramis brevibus divaricatis striatis. *Folia* crassiuscula lyrato-pinnatifida, lobo terminali oblongo-acuto v. obtuso rotundatoque haud raro lateraliter lobato inæqualiter calloso-serrato-dentato, lobis inferioribus irregulariter deorsum minoribus acutis v. obtusis calloso-dentatis horizontaliter v. suberecto-expansis, radicalia $1\frac{1}{2}$ poll. longa $\frac{1}{2}$ poll. lata vix petiolata amplexicaulia, caulinia minora late auriculata, suprema subcordata integra. *Capitula* circa 20-flora $\frac{1}{4}$–$\frac{1}{2}$ poll. longa oppositifolia in breves pseudo-racemos oligocephalos disposita, pedunculis purpureo-striatis $\frac{1}{4}$–$\frac{1}{2}$ poll. longis 1–2-bracteolatis bracteolis ovatis amplexicaulibus. *Phyllaria* intima linearia acuta v. obtusa scarioso-marginata, extima 3–4 late ovata acuta subherbacea multo-minora. *Antheræ* basi breviter sagittatim productæ. *Styli* lobi dense papillosi. *Achenia* multicostata compressa basi noncontracta apice in rostrum breve pallidum gradatim producta, costis acheniorum interiorum rugosis, acheniis exterioribus sæpe imperfectis costisque levibus. *Pappus* multiseriatus, setis scabridulis albis $\frac{1}{3}$ poll. longis acheniis æquilongis.

Socotra. On the plains. B.C.S. n. 595.

Distrib. Endemic.

Another species of *Lactuca* not uncommon on the island. Apparently a new one, but like the foregoing allied to several undescribed eastern species, of which specimens are in Kew Herbarium.

20. HETERACHÆNA.

Heteruchæna, Fresen. in Mus. Senkenb. iii. 74; Benth. et Hook. Gen. Pl. ii. 526.

A monotypic genus of Abyssinia, Arabia, and Beloochistan.

H. massaviensis, Fresen. in Mus. Senkenb. iii. 74; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 455.

Lactuca massaviensis, Sch. Bip. in herb. Schimp. Abyss. sect. iii. n. 1462; Franch. Sert. Somal. in Miss. Révoil 39.

Brachyramphus lactucoides, T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 23.

Zollikoferia massaviensis, Boiss. Flor. Orient. iii. 825.

Socotra. Common. B.C.S. nn. 159, 215, 349. Schweinf. n. 446.

Distrib. Of the genus.

An interesting plant, varying considerably in stoutness and size of parts, as it occurs on the island.

21. PRENANTHES.

Prenanthes, Linn. Gen. n. 911, pro parte; Benth. et Hook. Gen. Pl. ii. 527.

A genus of herbaceous plants of the temperate and subtemperate regions of the northern hemisphere, chiefly of North America, but a few reach the Canary Islands, Europe, and the hills of northern India. No species are yet recorded from Africa.

P. amabilis, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 842. Tab. XLIII.

Herba perennis cano-lanuginosa caule erecto in inflorescentiam abeunte; foliis lyrato-runcinatis, lobo terminali rotundato v. acutim lobato parte inferiore sæpe angustissima, amplexicaulibus axillariter lanato-villosis membranaceis glabris; capitulis longe pedunculatis 5–6-floris in laxe ramosas paniculas dispositis; phyllariis intimis 5–6 linearibus acutis, exterioribus brevibus; acheniis tetragonis truncatis basi angustatis pappo sordido setoso serrulato brevioribus.

Herba perennis 8-pollicaris collo lanuginoso, caule erecto herbaceo striato glanduloso-puberulo in inflorescentiam abeunte. *Folia* lyrato-runcinata, lobo terminali rotundato sæpius palmatim acute 3–5-lobato et dentato basique cuneato v. hastato-reniformi parte inferiore lobis obtusis parum dentatis sæpe angustissima, basi amplexicaulia et in axillis lanato-villosa membranacea glabra, radicalia sæpe $3\frac{1}{2}$ poll. longa loboque terminali 2 poll. diam., caulinia minora interdum auriculata. *Capitula* parva $\frac{1}{3}$ poll. longa 5–6-flora in pedunculis purpureis ultimis $\frac{1}{4}$–$\frac{1}{2}$ poll. longis sæpe nutantibus glandulis stipitatis puberulis bracteolisque squamiformibus apiculatis suffultis sessa et omnino inflorescentiam laxe ramosam paniculatam formantia. *Phyllaria* intima 5–6 linearia acuta subtiliter puberula sæpe purpurea $\frac{1}{5}$ poll. longa calyculi squamis 4–5 dimidio breviora. *Corolla* purpurea 5-dentata. *Antheræ* basi obtuse productæ. *Styli* lobi longi tenues papillosi. *Achenia* 4-gona truncata basi angustata noncompressa 4-costata, costis inconspicuis, obscure puberula $\frac{1}{10}$ poll. longa. *Pappus* sparsus sordidus setosus serrulatus $\frac{1}{8}$ poll. longus.

Socotra. On the rocks south-west of Galonsir, at an elevation over 1500 feet. B.C.S. n. 311.

Distrib. Endemic.

A lovely little species of the sheltered crannies on the rocks. Quite distinct from any known form and well worthy of cultivation.

22. REICHARDIA.

Reichardia, Roth Bot. Abhandl. (1787), 35.
Picridium, Desf. Flor. Atl. ii. 220; Benth. et Hook. Gen. Pl. ii. 527.

A small genus of herbs widely spread through south Europe, northern Africa, and eastern Asia.

R. tingitana, Roth Bot. Abhandl. (1787), 35; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 455.

Picridium tingitanum, Desf. Flor. Atl. ii. 220; DC. Prod. vii. 182; Boiss. Flor. Orient. iii. 877; Hook. fil. Flor. Brit. Ind. iii. 413.

Socotra. About Galonsir. B.C.S. nn. 188, 244. Schweinf. n. 551.

Distrib. Abundant in the Mediterranean region, and from the Canary Islands, through tropical Africa, to Arabia, Persia, and north-west India.

23. SONCHUS.

Sonchus, Linn. Gen. n. 908; Benth. et Hook. Gen. Pl. ii. 528.

A small genus of herbs, natives of the old world, several being now cosmopolitan.

S. oleraceus, Linn. Sp. 1116; Boiss. Flor. Orient. iii. 795; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 457; Hook. fil. Flor. Brit. Ind. iii. 414; Reichb. Ic. Flor. Germ. t. 1410, f. i.

Socotra. Common near habitations. B.C.S. n. 599.

Distrib. A cosmopolitan weed.

24. LAUNÆA.

Launæa, Cass. in Dict. Sc. Nat. xxv. (1822), 321.
Microrhynchus, Less. Syn. Comp. 139; Benth. et Hook. Gen. Pl. ii. 528.

A small genus of about twenty herbaceous species of the circum-Mediterranean region, Canary Islands, south Africa, and the Indian peninsula.

L. crepoides, Balf. fil. in Proc. Roy. Soc. Edin. xi. (1882), 842.

Herba rosulata glabra perennis; foliis spathulatis v. oblanceolatis basi longe attenuatis obtusis integris; capitulis solitariis in apices scaporum longorum bracteolatorum v. in laxas 2–3-ramosas cymas dispositis; phyllariis intimis 8 linearibus; calyculi squamis paucis ovatis herbaceis; styli lobis setulis nigris suffultis; acheniis linearibus subfusiformibus multo-costatis rugosis; pappo exteriore lanoso-intricato, intimo setoso.

Herba pusilla rosulata glabra perennis vix ramosa nonflagellifera. *Folia* spathulata v. oblanceolata longe basi attenuata vix petiolata, radicalia 3–3½ poll. longa sæpe multo minora ¼ poll. lata obtusa integra subcrassa. *Capitula* oblonga cylindrica ½ poll. longa 12–20-flora solitaria ad apices scaporum longorum bracteolatorum axillarium v. ad extremitates ramulorum longorum cymæ laxe 2–3-ramosæ scaposæ ultra folia longe exserta. *Phyllaria* intima

herbacea 8 linearia obtusa rarius erosa, calyculi squamis brevibus paucis ovatis herbaceis in bracteolas transeuntibus. *Corollæ* ligula 4-dentata. *Antheræ* basi breviter sagittatæ. *Styli* lobi elongati setulis nigris suffulti. *Achenia* linearia subfusiformia non rostrata 4-angulata facie quoque plerumque bicostato, costis angulisque rugosis. *Pappus* multiseriatus, exterior lanato-intricatus basi in annulum deciduum cum setis intimis paucioribus serrulatis cohærentibus.

Socotra. Not uncommon on the hills. B.C.S. n. 307. Schweinf. n. 570.

Distrib. Endemic.

It is notably extremely difficult to define the limits of genera amongst ligulifloral composites, and it is not without some suspicion that we refer our plant to this genus. In this determination I have been influenced mainly by the character of the pappus. Its dimorphism is very distinctive of the genus. But in the achenes our plant does not quite agree with the generic character. The many ribs and the somewhat spindle form brings it much nearer the species included in *Crepis*, under the section *Youngia*, from which section, indeed, its pappus is the only point excluding it. Where the relations of genera, as we accept them defined by Hooker and Bentham, are so intimate, and one species possesses, as in this instance, to some extent the characters of two genera, it practically comes to be merely a matter of convenience which genus receives preference.

In *Launæa* the Socotran plant has its affinity with *L. bellidifolia*, Cass. (in Dict. Sc. Nat. xxv. (1822), 321; Oliv. and Hiern in Oliv. Flor. Trop. Afr. iii. 460), a flagelliform species of considerable distribution in Africa, Mascarene Islands, and India. Its habit with many other characters readily distinguishes it.

Order XXXVII. CAMPANULACEÆ.

A large family, spread over the whole globe. Two genera are Socotran, one of which is essentially a northern hemisphere genus, and the other has its headquarters in the southern hemisphere.

1. WAHLENBERGIA.

Wahlenbergia, Schrad. Cat. Hort. Got. 1814, ex A. DC. Monog. Campan. 129; Benth. et Hook. Gen. Pl. ii. 555.

A large genus, chiefly of the southern hemisphere, the majority of species occurring in south Africa; a few are general old world plants and denizens of the Mediterranean region, and one is widely dispersed in western Europe.

W. riparia, Alph. DC. Monog. Campan. 146, and Prod. vii. 435; Hemsl. in Oliv. Flor. Trop. Afr. iii. 480.

Socotra. On the hills about Galonsir. B.C.S. n. 189.

Distrib. Tropical Africa (Upper Guinea).

Our plant has leaves rather larger than in the type.

2. CAMPANULA.

Campanula, Linn. Gen. n. 218; Benth. et Hook. Gen. Pl. ii. 561.

A very large genus of herbs, distributed in the northern hemisphere, especially abundant in the eastern portion of the Mediterranean region.

C. dichotoma, Linn. Amœn. iv. 306; DC. Prod. vii. 462; Boiss. Flor. Orient. iii. 929.

Socotra. Common on dry hill slopes. B.C.S. n. 288.

Distrib. Canary Islands, Mediterranean region, and Syria.

Our Socotran plant appears very different from the type of this species, having much smaller flowers and the calyx lobes less longly appendaged, besides being altogether a more delicate plant. In these characters it resembles the Algerian form described by Boissier and Reuter (Pug. Plant. Nov. Afr. Bor. (1852), 75), as *C. Kremeri*, which is really a variety of *C. dichotoma*. Our plant, is, however, a smaller form of the species than that is. *C. rigidiplia*, Hochst. et Steud. (in herb. Schimp. Abyss. sect. i. n. 167; Hemsley in Oliv. Flor. Trop. Afr. iii. 482), an Abyssinian plant, is an allied species, especially through the form referred to it by Hemsley, *C. sarmentosa*, Hochst. (*loc. cit.*, sect. ii. n. 1380), but it is a perennial, equally variable, however, both in size of flower and general robustness with our plant.

Order XXXVIII. PLUMBAGINEÆ.

A small family of herbaceous, sometimes shrubby or half-shrubby, plants, widely spread over the globe. Of the two Socotran genera, one has nearly the distribution of the order, the other is restricted to a few districts on the shores of the Indian Ocean.

1. STATICE.

Statice, Linn. Gen. n. 388, pro parte; Willd. Enum. Hort. Berol. 335; Benth. et Hook. Gen. Pl. ii. 625.

A large cosmopolitan genus of sea-shore and desert plants, but most abundant in the northern hemisphere of the old world.

1. S. axillaris, Forsk. Fl. Ægypt. Arab. 58; Boiss. in DC. Prod. xii. 663; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 29; Oliv. Flor. Trop. Afr. iii. 486; Boiss. Flor. Orient. iv. 868.

S. Bovei, Jaub. et Spach Ill. Pl. Or. i. 157, t. 86.

S. arabica, Jaub. et Spach *loc. cit.*, 156, t. 85; Boiss. Flor. Orient. iv. 868.

S. Stocksii, Boiss. in DC. Prod. xii. 664, and Flor. Orient. iv. 868; Clarke in Hook. Flor. Brit. Ind. iii. 480; Wight Illustr. ii. 225, t. 178; Hook. Ic. Pl. t. 837.
S. lanceolata, Edgew. in Journ. Asiat. Soc. Beng. xvi. (1847), 1218.

Socotra. Not uncommon. B.C.S. n. 102. Nimmo.

Distrib. Arabia, Somali Land, Egypt.

A widely-spread plant of the region of the Red Sea, varying somewhat in the relative length and breadth of leaf, in the elongation or contraction of the inflorescence, and in the clothing of the calyx-tube. I do not find any sufficient characters justifying the maintenance of either the Arabian or Scindian form as distinct species.

One of Nimmo's Socotran collection.

2. **S. cylindrifolia**, Forsk. Fl. Ægypt. Arab. 59; Vahl Symb. i. 26, t. 10; Boiss. in DC. Prod. xii. 664.

Socotra. On the clay margins of Khor Gharriah and on Nogad Plain. B.C.S. n. 528.

Distrib. South Arabia, Mokha.

This species, first described by Forskål and figured by Vahl, appears to have escaped the notice of collectors in recent times. In Kew Herbarium I find, under the name *Statice axillaris*, a coloured sketch by Col. Playfair of an Aden plant which has much resemblance with this species. But there are no specimens of such a plant from Aden, nor do I find any other record of its occurrence there. T. Anderson does not notice it. Graham in the addenda to his Catalogue of Bombay plants describes *Eurychiton adensis* as an Aden plant. This is referred by Bentham and Hooker (Gen. Pl. ii. 626) to *Statice*, and they remark "si corolla recte gamopetala descripta ad sectionem *Siphonantham* pertinet. Collectores recentiores in vicinibus Aden *S. axillarem*, Forsk., solam invenerunt quæ ad *Limonii* species suffruticosas habitu *Armeriastro* accedentes pertinet." Graham's description of the flower of his plant suits *S. cylindrifolia*, that of the foliage suits *S. axillaris*. Whether or no the plant occurs at Aden, its existence in south Arabia has been demonstrated recently by Schweinfurth, who sends excellent specimens from near Bolhaf, where the Arabic name for it is "Tissumm." Boissier (*loc. cit.*) suggests its occurrence in Upper Egypt.

2. VOGELIA.

Vogelia, Lamk. Illustr. ii. 147, t. 149; Benth. et Hook. Gen. Pl. ii. 628.

A small genus, including three species of shrubby plants, one of which is peculiar to south Africa, another is endemic in Socotra, and the third, which is found in north-west India and Arabia, extends also to Socotra.

1. **V. indica**, Gibs., ex Wight in Calc. Journ. Nat. Hist. vii. 17, and Ic.

t. 1075; Boiss. in DC. Prod. xii. 696, and Flor. Orient. iv. 876; Clarke in Hook. Flor. Brit. Ind. iii. 481.

V. arabica, Boiss. in DC. Prod. *loc. cit.*,

var. **socotrana**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Omnino tenuior; foliis minoribus sæpe vix perfoliatis et retusis; inflorescentia multo pseudo-furcatim ramosissima, racemis ultimis 1–2 poll. longis; bracteolis lanceolatis; sepalis anguste lanceolatis margine membranaceis superne obscure transverse bullato-undulatis inferne truncatis; corollæ limbo sinu apicali vix mucronulato.

NOM. VERN. Salēpho (B.C.S.).

Socotra. On the slopes of Haghier. B.C.S. n. 416. Schweinf. nn. 406 in lit., 523.

DISTRIB. Arabia and north-west India.

I have had some hesitation in referring the Socotran plant to this species, but have concluded, after examination of specimens in Kew Herbarium, that it should be considered as conspecific, though there are several points of divergence.

Firstly, as regards habit,—the Indian and Arabian plant is altogether stouter than the Socotran usually is, but at times the latter assumes a tolerably robust habit. In foliage,—I have never seen leaves in the Socotran plant so large as those figured by Wight, but these appear to have been exceptionally large, and in Kew Herbarium I only find one specimen showing leaves at all approaching them in size. Then in inflorescence,—this, in our Socotran plant, is a sympodially branched, lax, spreading panicle, the terminal racemes of which are rarely over an inch and a half or two inches in length. In the type form the inflorescence is not so freely branched, and the ultimates are often six inches or more long. The bracts in our specimens are hardly so cuspidate as in the type, and the sepals are not so broad, their membranous margin is narrower, with its transverse bullate undulation very slightly marked, indeed conspicuous only towards the apex of the sepal, and at the base it is not so rounded but more abruptly truncate. There are thus a considerable number of points in which our plant differs from the type, though, as regards the calycine characters, the Arabian specimens supply an intermediate condition between the Indian and the Socotran forms; but it is, I believe, deserving of a varietal designation as an insular form.

2. **V. pendula**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 76. Tab. XLIV.

Fruticosa ramis pendulis; inflorescentia diffusa paniculata; sepalorum marginibus membranaceis vix bullatis intus glandulis instructis; corollæ lobis sinu non mucronulato.

Frutex elatus 10-pedalis tenuis ramis elongatis virgatis pendulis striatis glaucis in inflorescentiam gradatim excurrentibus. *Folia* late cuneato v. trapeziformi-spathulata $\frac{2}{3}$–1 poll. longa $\frac{5}{12}$–$\frac{3}{4}$ poll. lata apice mucronata v. subretusa basi in petiolum angustum attenuata subcrassiuscula subtus lepidota. *Flores* brevissime pedicellata in racemos breves anfractuosos

dispositi ramulos ultimos laxæ multiramosæ patentis paniculatæ inflorescentiæ formantes; bracteolæ ovato-acutæ late amplexicaules pedicellis longiores. *Sepala* linearia acuto-punctata ⅓ poll. longa costa media prominula utrinque margine anguste membranacea vix superne bullata inferne supra basin costæ abrupte truncata intus glandulis prominulis suffulta. *Corolla* sepalis duplolongior, limbo obcuneato-bilobo sinu non mucronulato. *Staminum* filamenta basi abrupte dilatata; antheræ basi furcatæ. *Styli* lobi crassi intus grosse papillosi. *Fructus* calyci æquilongus.

Socotra. On the slopes of Haghier south from Tamarida. B.C.S. n. 411. Schweinf. n. 586.

Distrib. Endemic.

A very distinct species of this genus. In foliage it resembles the south African *V. africana*, Lamk. (Illustr. ii. 148, t. 149; Boiss. in DC. Prod. xii. 696). But its inflorescence and flowers and general habit separate it. It is a lovely shrub, with long hanging branches.

Order XXXIX. PRIMULACEÆ.

A considerable order of herbs, chiefly dispersed in the temperate regions of the northern hemisphere, more rare in the southern hemisphere.

ANAGALLIS.

Anagallis, Linn. Gen. n. 206; Benth. et Hook. Gen. Pl. ii. 637.

A small genus, containing some widely-spread and commonly cultivated plants, of which one, occurring in Socotra, is spread over the whole world.

A. arvensis, Linn. Sp. 211; Duby in DC. Prod. viii. 69; Ach. Rich. Tent. Flor. Abyss. ii. 16; Oliv. Flor. Trop. Afr. iii. 490; Boiss. Flor. Orient. iv. 6; Hook. fil. Flor. Brit. Ind. iii. 506.

Anagallis phœnicea, Lamk. in herb. Schimp. Arab. n. 891.

Socotra. Abundant. B.C.S. n. 199.

Distrib. In common cultivation, and spread over the world.

It is the blue variety (*A. cœrulea*, Lamk.), which occurs in Socotra.

Order XL. MYRSINEÆ.

A considerable order of trees or shrubs of the warmer regions of both worlds. Most sparingly represented in tropical Africa.

MYRSINE.

Myrsine, Linn. Gen. n. 269; Benth. et Hook. Gen. Pl. ii. 642.

A genus found all round the world, chiefly in tropical regions.

M. africana, Linn. Sp. 285; Alph. DC. Prod. viii. 93; Baker in Oliv. Flor. Trop. Afr. iii. 493; Boiss. Flor. Orient. iv. 31; Clarke in Hook. Flor. Brit. Ind. iii. 511; Lamk. Illustr. ii. 49, t. 122.

Socotra. A shrub of the Haghier hills. B.C.S. n. 589.

Distrib. Himalayan region and Afghanistan, and in tropical Africa, at the Cape of Good Hope, and in the Azores.

Our Socotran specimens of this species are from much larger leaved plants than any of the African specimens in Kew Herbarium. Some Cape forms approach them in size. They are of the broad type found in the African plants, differing from the narrow-leaved condition characteristic of Indian specimens.

Order XLI. SAPOTACEÆ.

A considerable order of trees or shrubs, occurring in the tropics of both hemispheres.

SIDEROXYLON.

Sideroxylon, Linn. Gen. n. 264; Benth. et Hook. Gen. Pl. ii. 655.

A considerable tropical genus, but reaching in extratropical regions to Madeira, the Cape, and New Zealand.

S. fimbriatum, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 76.

Arboreum glabrescens ramis rugosis; foliis petiolatis exstipulatis ellipticis v. oblongo-ellipticis v. obovatis obtusis basi subcuneatis subtus pallidis; fasciculis sessilibus; pedicellis brevibus validis; calycis lobis suborbicularibus; corolla calyce longiore; staminum filamentis glabris; staminodeis petaloideis obovatis fimbriatis; fructu rostrato.

Arbor glabrescens ramis validis rugosis lenticellis verrucosis, juvenilibus fusco-tomentosis *Folia* petiolata exstipulata elliptica v. oblongo-elliptica v. a medio versus basim angustata et subobovata apice obtusa v. late rotundata nonnunquam emarginata rarius late acuta basi plus minusve cuneata plerumque inæquilateralia 2½–3 poll. longa 1–1½ poll. lata coriacea integra margine subundulata revoluta, juvenilia fusco-pubescentia, altiora omnino glabra pennivenia venis immersis supra nigro-viridia subtus pallidiora. *Fasciculi* sessiles 6–10-flori; pedicelli validi ¼ poll. longi fusco-puberuli, fructiferi corrugati glabri. *Flores* parvi. *Calycis* lobi $\frac{1}{12}$ poll. longi suborbiculares late inserti, 3 exteriores imbricati subcarinati extus puberuli, 2 interiores valvati tenuiores oppositi. *Corolla* alte 5-fida, segmentis latis subrotundatis tubo multo majoribus ⅙ poll. longis extus glabris. *Stamina* corollæ æquilonga, filamentis subulatis glabris; antheræ ovato-acutæ basi sagittatæ extrorsæ dorso-affixæ. *Staminodia* corollæ æquilonga petaloidea obovata v. subobcuneata venulo medio incrassato parte superiore subtrapeziformi eroso-fimbriata. *Ovarium* adpresse pilosum; stylus corollæ vix æquilongus validus. *Fructus* ovoideus ⅓ poll. longus nitidus glaber fulvus stylo persistente rostratus.

Socotra. In the valley opening upon Kadhab plain. Not abundant. B.C.S. n. 339.

Distrib. Endemic.

A quite distinct species. Its nearest ally is *S. diospyroides*, Baker (in Oliv. Flor. Trop. Afr. iii. 502), a Zanzibar form. But the floral characters, especially of the corolla and the staminodes, sufficiently separate them.

Order XLII. EBENACEÆ.*

An order of tropical and subtropical trees or shrubs, having their head-quarters in the East Indies.

EUCLEA.

Euclea, Linn. Syst. Nat. ed. Murray ii. 747; Benth. et Hook. Gen. Pl. ii. 664.

A small genus, restricted to south and tropical Africa. In Socotra we have three species, two of them endemic; the third is doubtfully an Abyssinian one. There may be five species on the island, as fragmentary specimens of two other plants appear to belong to this genus.

1. E. laurina, Hiern in Proc. Roy. Soc. Edin. xiii. (1883).

Fruticosa; foliis ellipticis v. obovatis suboppositis v. oppositis apice plus minusve rotundatis basi cuneatis breviter petiolatis supra intense viridibus; racemis axillaribus; floribus 4-rarissime 3-meris; corolla anguste cylindrata breviter lobata.

Frutex ramosus glaber, ramis alternis suboppositis v. oppositis cinereis, ramulis gracilibus lævibus apice squamulis glandulosis parvis rubellis inductis. *Folia* opposita v. subopposita elliptica v. obovata apice plus minusve rotundata basi cuneata attenuata integerrima coriacea v. pergamena plus minusve undulata supra intense viridia infra pallidiora $1\frac{1}{4}$–3 poll. longa $\frac{1}{2}$-$1\frac{1}{4}$ poll. lata margine anguste incrassato-revoluta, venis lateralibus inconspicuis; petiolus $\frac{1}{10}$–$\frac{1}{5}$ poll. longus basi articulatus. *Racemi* (♀ ?) axillares $\frac{1}{5}$–$\frac{3}{4}$ poll. (floribus exclusis) longi ut videtur 3–7-flori, squamulis glandulosis parvis rubellis conspersis; pedicelli alterni v. oppositi $\frac{1}{12}$–$\frac{1}{6}$ poll. longi. *Flores* graciles semipollicares v. paulum breviores tetrameri, rarissime trimeri. *Calyx* poculiformis $\frac{1}{12}$ poll. longus v. paulum brevior glaber sæpissime 4-fidus sub fructu non vel vix accrescens, lobis deltoideis appressis. *Corolla* anguste cylindrata glabra apice breviter lobata, lobis obtusis in æstivatione sinistrorsum (ab axe deorsum spectanti) convolutis, cylindro gracili firmiter carnoso maximam partem consolidato. *Stamina* nulla. *Ovarium* parvum minute pilosum. *Fructus* solitarius ovoideo-globosus $\frac{1}{4}$–$\frac{1}{3}$ poll. longus $\frac{1}{5}$–$\frac{1}{4}$ poll. diam. pilis brevibus appressis conspersus v. glabratus, stylo brevi erecto basi piloso apice sæpius 4-fido (vel stylis 2 contiguis apice bifidis) desinens. *Semen* unicum subglobosum.

Socotra. On Haghier and near Galonsir. B.C.S. nn. 166 ?, 383.

Distrib. Endemic.

This species differs from all previously known species of *Euclea* by the long narrow shape of its corolla. n. 166, perhaps, belongs to this species. It has leaves sometimes alternate, and with a greater range of size.

* I am indebted to Mr. W. P. Hiern for the identification and description of the Ebenaceæ, and for the subjoined notes.

2. **E. Balfourii,** Hiern in Proc. Roy. Soc. Edin. xiii. (1883).

Fruticosa; foliis ovalibus v. obovatis oppositis v. suboppositis apice rotundatis basi plus minusve angustatis demum plerisque obtusis undulatis supra viridibus infra rubentibus resinoso-lepidotis; racemis masculis axillaribus; floribus 4-meris; corolla late campanulata.

Frutex dioicus ramosissimus, ramis alternis vel oppositis hinc inde approximatis 3–5-nis cinereis glabratis, ramulis lepidoto-resinosis. *Folia* opposita v. subopposita ovalia v. obovata apice rotundata basi plus minusve angustata demum plerumque obtusa firmiter coriacea in sicco late undulata supra viridia glabra infra rubentia resinoso-lepidota $\frac{2}{3}$–$1\frac{2}{3}$ poll. longa $\frac{1}{3}$–1 poll. lata margine integra anguste incrassato-revoluta, venis lateralibus haud conspicuis; petiolus lepidoto-resinosus $\frac{1}{12}$–$\frac{1}{8}$ poll. longus basi articulatus. *Racemi* florum masculorum axillares rufi lepidoto-resinosi $\frac{1}{4}$–$\frac{1}{2}$ poll. (floribus exclusis) longi plerique 5–7-flori; pedicelli patentes $\frac{1}{10}$–$\frac{1}{8}$ poll. longi. *Flores* late campanulati 4-meri $\frac{1}{8}$ poll. diam. *Calyx* hemisphæricus rubro-lepidotus 4-fidus, lobis late ovatis obtusis apiculatis. *Corolla* calyce bis longior dorso adpresse pilosa, lobis tubo bis longioribus obtusis sub alabastro sinistrorsum (ab axe deorsum spectanti) convolutis. *Stamina* 16 biserialia basi corollæ inserta, filamentis exterioribus longioribus; antheræ oblongæ connectivo dorso piloso. *Ovarium* rudimentarium pilosum.

Socotra. On the Haghier hills. B.C.S. n. 167. Schweinf. n. 644.

Distrib. Endemic.

The female plant is unknown. This new plant is to be placed between *E. ovata,* Thunb., and *E. divinorum,* Hiern (Monog. Eben. 99, and in Oliv. Flor. Trop. Afr. iii. 513), both of which are south African species, the former extratropical and the latter tropical as well as extratropical. It is also nearly related to some forms of *E. lanceolata,* E. Mey. (Cat. Pl. Exsiccat. Afr. Austr. Drèg. 7; Hiern in Oliv. Flor. Trop. Afr. iii. 512), a species of wide distribution over Africa, south of the equator. It is best distinguished from its allies by the shape, colour, and waviness of its leaves.

3. ? **E. Kellau,** Hochst. in herb. Schimp. Abyss. sect. ii. n. 1078; Alph. DC. Prod. viii. 219, 289, 672; Hiern in Oliv. Flor. Trop. Afr. iii. 514.

Socotra. Abundant. B.C.S. n. 611.

Distrib. Abyssinia.

This differs from the *E. Kellau,* Hochst., of Abyssinia, by its more coriaceous leaves, rather more patent branches, rather shorter racemes of the female flowers, and by its hairy ovary or young fruit. In the present state of our knowledge of the plant, the male plant and the flowers of each sex being unknown, it may be temporarily regarded as a variety of *E. Kellau,* and it will, perhaps, prove to be identical with the Arabian *Nakus* of Forskål (Fl. Ægypt. Arab. 197).

4. **Euclea** sp. ?

A specimen, without flowers and fruit; may be of this genus. One of the leaves is bifid.

Socotra. On Haghier. B.C.S. n. 164.

5. Euclea sp.?

A fragmentary specimen, with no flowers and fruit, and only the remains of one flower seen; is too imperfect for identification.

Socotra. On Haghier. B.C.S. n. 201.

Order XLIII. OLEACEÆ.

A small order of temperate and warmer regions of both old and new worlds.

JASMINUM.

Jasminum, Linn. Gen. n. 17; Benth. et Hook. Gen. Pl. ii. 674.

A genus of some size, including odoriferous and beautiful flowering shrubs, often twining, dispersed over the warmer regions of the old world, with a few South American species.

J. rotundifolium, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 77. Tab. XLV.

Fruticosum scandens velutino-puberulum; foliis trifoliolatis, foliolis petiolulatis subæqualibus v. terminali majore rotundatis v. ellipticis obtusis; cymis paniculatis terminalibus; floribus majoribus pedicellatis; calyce truncato; corollæ tubo elongato, lobis 5–6 oblongis; baccis sæpe 2 globosis.

Frutex alte scandens caulibus subtetragonis puberulo-velutinis. *Folia* opposita trifoliolata petiolata $2\frac{1}{2}$–$3\frac{1}{2}$ poll. longa, petiolo $\frac{2}{3}$–$\frac{3}{4}$ poll. longo puberulo; foliola subæqualia sed terminale frequentius majus rotundata v. elliptica v. suborbicularia obtusa sæpe emarginata basi nonnunquam inæquilateralia late cuneata $1\frac{1}{4}$–2 poll. longa $\frac{3}{4}$–2 poll. lata omnia petiolulata (petiolulo folioli terminalis $\frac{2}{3}$–1 poll. longo, lateralium $\frac{1}{6}$ poll. longo) glabra nitida sed subtus axillis nervorum 2–3 primarium basalium villosis. *Cymæ* terminales multifloræ paniculatæ; pedicelli $\frac{1}{2}$ poll. longi sursum dilatati puberuli; bracteolæ minutæ ovatæ amplexicaules. *Flores* majusculi. *Calyx* truncatus margine suberosus $\frac{1}{10}$ poll. longus. *Corollæ* albæ suaveolentæ tubus $\frac{3}{4}$ poll. longus, limbi lobi 5–6 oblongo-obtusi $\frac{1}{3}$ poll. longi. *Stamina* supra medium tubi inserta; antheræ lanceolatæ obtusæ filamentis duplolongiores. *Stylus* exsertus supra complanatus apice breviter bilobatus. *Fructus* sæpe didymus, bacca quaque globosa $\frac{1}{4}$ poll. diam. nigra nitida.

Socotra. On the hills in several places, often at a high altitude. B.C.S. n. 173. Schweinf. n. 649.

Distrib. Endemic.

A very sweet-scented species. We found it very abundant on the eastern plateau of the island, but it occurs also on Haghier.

It is closely allied to *J. mauritianum*, Bojer (Hort. Maur. 204; DC. Prod. viii. 310), a plant of Mauritius and Seychelles, erroneously referred by Baker (Flor. Maur. and Seych. 220) to *J. auriculatum*, Vahl (Symb. iii. 1; DC. Prod. viii.

309), which is a very different plant, with smaller flowers, fruits, and leaves. So close is the resemblance between our species and the Mascarene and Seychelles one, that, at first, one might almost regard them as conspecific; but they may be diagnosed by the following features :—The leaves in our plant are never narrowed to the apex as in the Mauritian one, they never have a cordate base (it is always more or less wedge-shaped), the flowers are on longer pedicels and the whole cyme is more substantial, the calyx is thoroughly and always truncate, and the fruit is much larger. From *J. auriculatum* the separation is still wider, and the difference in size of the flowers and leaves is readily recognisable.

Order XLIV. SALVADORACEÆ.

A small family of three genera of trees or shrubs of tropical and subtropical regions, inhabiting western Asia, Africa, and the islands of the Indian Ocean.

SALVADORA.

Salvadora, Linn. Gen. n. 163; Benth. et Hook. Gen. Pl. ii. 681.

A genus of three species with the distribution of the order.

S. persica, Linn. Sp. 178; Lamk. Illustr. i. 323, t. 81; Alph. DC. Prod. xvii. 28; Boiss. Flor. Orient. iv. 43; Clarke in Hook. Flor. Brit. Ind. iii. 619; Roxb. Corom. Pl. i. 26, t. 26.

Socotra. Near Tamarida. B.C.S. n. 334.

Distrib. From Syria and tropical Africa to India.

Abundant on the island. The inhabitants use the twigs as tooth-sticks. Camels feed largely on this plant, hence the specimens are usually dwarfed.

Order XLV. APOCYNACEÆ.

A large tropical and subtropical order of both hemispheres. Its Socotran development is interesting. Three genera are represented, each by one species. One of these is endemic, with quite an exceptional habit in the order, one is a tropical and south African and Arabian genus, and the third has a wider range in Africa, tropical Asia, and Australia.

1. CARISSA.

Carissa, Linn. Mant. n. 1251; Benth. et Hook. Gen. Pl. ii. 695.

A small genus of shrubby, usually spiny plants, inhabiting Africa, tropical Asia, and tropical Australia.

C. Schimperi, Alph. DC. Prod. viii. 675; Ach. Rich. Tent Flor. Abyss. ii. 31, t. 68.

Socotra. Not uncommon. B.C.S. n. 593. Schweinf. n. 668.

Distrib. Abyssinia.

There may be some doubt as to this identification. I have seen no specimens of the Abyssinian plant, but with the description and the figure our plant accords very well. Especially does it conform in the features which are mentioned as strongly characteristic of the species, viz :—the glabrousness, the green branchlets, and its generally non-spiny habit. In this last character, however, it varies, for I find on some of our specimens minute and sometimes prominent spines. The chief points of difference are found in its shorter and fewer flowered inflorescences, narrower corolla lobes, and smaller fruit.

2. SOCOTORA.

Socotora, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 77.

Calyx brevis 5-partitus basi intus glandulosus segmentis acutis. Corolla late campanulata, tubo brevissimo, fauce squamis 2-seriatis connatis instructo, exterioribus 5 flagelliformibus sinubus oppositis, interioribus 10 rotundatis obliquis per pares lobis oppositis; lobi 5, oblongo-ovati, obtusi, emarginati, ecaudati, antice rubro glandulo pannosi, contorti, dextrorsum obtegentes. Stamina 5 tubo affixa, filamentis validis, decurrentibus, basi dilatatis et inter se squamis connatis; antheræ exsertæ, subovatæ, acutæ, circum stigma conniventes non adhærentes, connectivo lato dorso villoso, loculis basi cassis in appendiculas breves rotundatas productis. Pollen granulosum in quoque loculo in massas 2 cohærens. Discus 0. Ovarii carpella 2 conjuncta; stylus validus brevis; stigma dilatatum vertice depresso-conicum, lateraliter 5-gonum, galeis 5 cinctum et appendicula stigmatica ab quoque angulo pendula instructum; ovula in quoque loculo numerosa. Folliculi lineares divaricatim adscendentes et basi connati. Semina lanceolata trigono-compressa apice comosa; albumen copiosum firmum; cotyledones lineari-oblongæ, rectæ, planæ, crassiusculæ, radicula supera longiores.—Frutex scandens, glaber, crassiusculus, aphyllus. Folia cataphyllaria opposita. Flores solitarii axillares.

A monotypic genus, with the habit and general appearance of *Periplocæ*, especially of *Periploca* itself; but it is excluded from Asclepiadaceæ by the absence of the corpuscles bearing the pollen, the only character by which Apocynads are distinguishable from Asclepiads.

In the Apocynaceæ it belongs to the tribe of the *Echitideæ* with appendaged anthers. But in this tribe it is somewhat exceptional, and indeed in the whole family it is remarkable on account of the complexity of its floral structure. This is worthy of special mention. In the first place each corolla lobe has on its face a large red glandular patch, secreting a very tenacious substance. On the throat of the corolla are two sets of scales, an outer of five and an inner of ten pieces, or perhaps one may say one set of five scales, each of which is divided into three pieces, the central one being external, the other two internal. The central ones are long, filiform structures, opposite the sinuses of the corolla

expanding at the base, and joining on to the lateral short rounded lobes, each of which is set on the corolla at an obtuse angle to the radius of the flower, and forms with the base of the filiform lobe a small cup on the surface of the corolla. The lateral lobes of each scale nearly coalesce across each corolla lobe. The stamens, which have short filaments, stand embraced between the lateral lobes of the scales and opposite the central lobe, and are attached below this last to the corolla tube by an insertion extending to the bottom of the tube. At the base of the tube the filaments expand laterally, become connate, and thus form a ring around the pistil, and the interstaminal portions of this ring are produced into fimbriated scales, which, bending inwards, conceal the ovary. But the stigmatic structure is more remarkable. The stigma is expanded into a large more or less peltate disc, with a low conical vertex, but it is 5-angled at the side, and each surface of this small pyramid is clothed with a membranous inverted hood, from the inferior extremity of which there depends by an elastic membranous articulation a somewhat brick-shaped body, hollowed on one side and closely appressed at first to the style. It is not difficult to disengage these appendages from the style, and then they spring up by means of their articulation and project from the stigma at a greater or less angle. The stigma is altogether more Asclepiadaceous than Apocynaceous. But as I have already mentioned, the stamens are quite free from it, and there are no pollen corpuscles. What is the nature of these bodies pendant from the stigma, remains doubtful. They can hardly be corpuscles, as the stamens are always quite free and separate from the stigma, and the bodies do not approach the anther sacs. They may be the stigmatic surfaces. Each has a viscid concavity, and we find in some genera of Apocynads lateral portions of the style sometimes stigmatiferous. Or they may be merely secreting glandular appendages. Unfortunately we have but a few flowers for examination, and are therefore unable to determine this point.

Amongst *Echitideæ* the genus is aberrant. The aphyllous habit is very exceptional, not only in the tribe but in the order. Most genera in this tribe have the carpels distinct from one another below the style, but there are a few genera, — *Vallaris, Lyonsia, Parsonsia,* and others,—in which the carpels are connate, and this is their character in our Socotran genus. The three I have mentioned fall into the section of the *Parsonsieæ,* characterised by the connivent anthers forming an exserted cone; and our genus conforming with that character must be referred to the same tribe, and its position is in the vicinity of the above genera.

Its individuality is so strong that it is hardly necessary to refer in detail to the characters by which it is diagnosed from the neighbouring genera. The seed comose at the apex, and the straight cotyledons, and its distribution, exclude it from all except some five old world genera, *Pottsia* and *Isonema* being the two in addition to the three above mentioned. From them the stamens not

adhering to the stigma, with anther cells at the base rounded and empty but not produced into a long rigid appendage, with the many characters of the scales and stigma, completely separate it.

ETYM. Socotora, an older name for the island of Socotra.

S. aphylla, Balf. fil. *loc. cit.* Tab. XLVI.

Frutex glaucus late scandens multo pseudo-dichotome ramosus, ramulis teretibus crassis, internodiis 1½–2 poll. longis, nodis constrictis. *Folia* cataphyllaria minute late ovata ciliata. *Flores* pauci, pedicellis ⅕ poll. longis. *Calyx* 1½ poll. longus, segmentis ovatis glabris. *Corolla* ⅓ poll. longa, squamis exterioribus longissimis lobis corollæ æquilongis v. longioribus. *Antheræ* loculi in parte triente inferna cassi. *Squamæ* basales interstaminales inflexæ fimbriatæ. *Stigmatis* appendiculæ oblongæ muriformes concavæ articulo membranaceo galeis ad angulas affixæ. *Folliculi* 4 poll. longi glabri. *Semina* ad extremitates ambos attenuata ⅛ poll. longa.

Socotra. On the hill slopes, south-west of Galonsir. Rare. B.C.S. n. 327.

DISTRIB. Endemic.

A plant we only found in one locality, spreading over the boulders on the hill slopes.

3. ADENIUM.

Adenium, Rœm. et Schult. Syst. iv. xxxv, and 411; Benth. et Hook. Gen. Pl. ii. 722.

An interesting genus, including six or seven species, natives of Africa and Arabia.

A. multiflorum, Klotzsch in Peters' Mossamb. 279, t. 44.

NOM. VERN. Œsfed or Isfed (Schweinf.). Assett (Wellst.).

Socotra. Abundant on the hills. B.C.S. nn. 139, 174, 695. Schweinf. n. 245.

DISTRIB. East tropical Africa (Mozambique).

This species, to which we consider our Socotran plant may be referred, has been hitherto recognised as an east tropical African plant only. It is nearly allied to a west tropical African form, *Ad. Honghel,* DC., but has villous lines inside the base of the corolla tube. Probably it will be eventually found over a considerable district in east tropical Africa.

On Socotra the plant varies much in size of leaf and of flower. The African plant is small-flowered, resembling those found on the south side of the hills of Socotra. Some of our plants have flowers twice as large as those figured by Klotzsch. Klotzsch mentions glands on the leaves of his plants, but questions their normality. There are no such glands on our specimens.

This Socotran plant is, I believe, the one referred to by Wellsted (in Journ. Roy. Geogr. Soc. v. (1835), 198), as the Assett tree. (See page 101 of this volume.) It is abundant, and forms in many places most fantastic plants. Some of them have a broad basal trunk as much as six or eight feet in diameter,

and only about a foot and a half high, and from the top of this rise a few rapidly tapering branches, each ending in a small tuft of leaves, or, it may be, in a truss of beautiful pink flowers.

There has been great confusion in the nomenclature of the species of *Adenium* from Arabia and tropical Africa, and I may here attempt to clear up the confusion.

Rœmer and Schultz (Syst. iv. xxxv, and 411) constituted the genus *Adenium* for a plant collected by Forskål in the vicinity of Melhan in Arabia, north-west of Mokha, which he shortly described—(Fl. Ægypt. Arab. 205)—under the name *Nerium obesum*, thus:—"foliis sparsis oblongis; ramis loriformibus. Caudex mollis, bulbum referens supra terram, volumine capitis humani."

It is to be observed that he does not say anything as to the texture or the indumentum of the leaves. Vahl (Symb. ii. 45.) gives, under the same name, a fuller description of Forskål's plant, and there is no reason to doubt that his description was founded on Forskål's specimens. His description of the leaves is as follows:—"folia oblonga ad apices ramorum, approximata, subpetiolata, sæpe tripollicaria, basi angustiora mucronata, avenia: subtus villoso-tomentosa: juniora utrinque mollia."

G. Don (Gen. Syst. iv. 80) takes up this same plant under Rœmer and Schultz's name *Adenium obesum* (*Adenum* he writes). But Sprengel (Syst. Veg. i. 641) refers to it as *Cameraria obesum*. Alphonse De Candolle (Prod. viii. 412) rightly reverts to the generic name *Adenium*, and in addition to *Ad. obesum*, Rœm. and Schult., he describes a second species, *Ad. Honghel*, a west tropical African form, which is quite a distinct one, having glabrous leaves and the corolla tube internally glabrous.

Now in the Botanical Register, xxxii. t. 54, we find a figure and a description purporting to be of *Ad. Honghel*, DC. The description is quoted from De Candolle's Prodromus, and is that of *Ad. Honghel*, but it does not apply to the figure, which is that of a species found at Aden, and not the west tropical African plant. This Aden plant is the one which has always been best known, and was introduced into cultivation and flowered in Britain prior to 1841. But, strange to say, it has never been correctly named. T. Anderson (in Journ. Linn. Soc. v. (1860), Suppl. 23) describes the Aden plant as *Ad. obesum*, Rœm. and Schult., and under this name it has become generally known,—and he supposed it to be Forskål's plant, and the one referred to by Don and Sprengel, and also the species *Ad. Honghel* of the Botanical Register, though not of De Candolle. He refers to the leaves as "ellipticis ovatis v. spathulatis . . . . . glabris." This is a correct description of the Aden plant, but it evidently refers to one very different from Forskål's plant,—the one described by Rœmer and Schultz; and whilst it suits the figure under *Ad. Honghel*, in the Botanical Register, to which he refers, yet the description there given is, as I have said above, of a different species, viz., of the true *Ad. Honghel*, DC.

Thus the Aden plant has been confounded with the *Ad. obesum*, Rœm. and Schult., and with *Ad. Honghel*, DC., from both of which it is different, and these latter species have also been confounded together. The Aden plant has been more recently figured in the Botanical Magazine, t. 5418, as Forskål's plant, under the name *Ad. obesum*. Here, again, there is confusion; the figure is rightly enough the Aden plant, but the description is inapplicable, and is that of the true *Ad. obesum*, Rœm. and Schult.

The fact is, there are two Arabian species, the old *Ad. obesum*, Rœm. and Schult., not known from Aden, and the Aden plant, to which we must now give a name, and I propose *Ad. arabicum*. They are both quite distinct from *Ad. Honghel*, DC.

Fenzl (Diagn. Æthiop. in Kais. Akad. Wiss. Wien, li. (1865), 140) diagnoses a form from Æthiopia, as *Ad. speciosum*, distinguishing it from *Ad. Honghel*, DC., by its general pubescent character, and the subracemose flowers. From the glabrous *Ad. Honghel*, DC., the form is quite distinct, but I cannot separate it from *Ad. obesum*, Rœm. and Schult., which is quite as tomentose, and the subracemose floral arrangement is worth little, for one finds there is a tendency in all species to elongation of the rhachis; indeed Rœmer and Schultz's original description speaks of the inflorescence as a corymb. Fenzl's plant, then, I take to be merely *Ad. obesum*, which is thus not an endemic Arabian form.

The east tropical African plant, *Ad. multiflorum*, Klotzsch, is a form quite distinct from the above three species, and readily distinguishable by its glabrous leaves with veins conspicuous below, and the corolla tube internally lined with hairs. With it our Socotran plant appears conspecific.

In Kew Herbarium some specimens from Somali Land belong to a very distinct form, which may be described as new under the name *Ad. somalense*. It is readily distinguished by its almost linear glaucous leaves. There is but one flower on the plant, and I have hesitated to dissect it; but it apparently wants the hairy lines at the base of the corolla tube inside.

Besides these I have mentioned, the genus is represented in south Africa by some forms distinct specifically, but of which material is not yet forthcoming for complete diagnosis.

It may be well if I now give concisely the synonymy of the several species I have mentioned above, with a short diagnosis of each.

A. obesum, Rœm. et Schult. Syst. iv. xxxv, and 411; G. Don* Syst. iv. 80; Alph. DC. Prod. viii. 412; Hook. Bot. Mag. descr. sub tab. 5418, non. ic.

A. speciosum, Fenzl Diagn. Æthiop. in Kais. Akad. Wiss. Wien, li. (1865), 140.

Nerium obesum, Forsk. Fl. Ægypt. Arab. 205; Vahl Symb. ii. 45.

* Alph. De Candolle quotes Don, and in this he is followed by T. Anderson, and in the Botanical Magazine, as referring this plant to the genus *Pachypodium*. But I cannot discover this. Don rightly enough writes of *Adenium* (or *Adenum*) *obesum*, but in a note he says, "See *Pachypodium*, p. 78, for culture and propagation," and this may have originated the mistaken quotation.

Cameraria obesum, Spreng. Syst. Veg. i. 641.

Foliis oblongis sæpe obovatis eveniis subtus villoso-tomentosis, junioribus utrinque mollibus; corollæ tubo inferne intus lineato-villoso.

DISTRIB. Arabia, Nile Land, Nubia, and east tropical Africa.

A. Honghel, Alph. DC. Prod. viii. 412; Bot. Reg. xxxii. (1846), descr. sub tab. 54, non. ic.

Foliis obovato-oblongis basi attenuatis subsessilibus glabris; corollæ tubo inferne intus glabro.

DISTRIB. Senegambia and west tropical Africa.

A. arabicum, Balf. fil.

A. Honghel, Bot. Reg. xxxii. t. 54, ic. sol. non. descr.

A. obesum, T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 23, syn. partim excl. (non. Rœm. et Schult.).

A. obesum, Hook. Bot. Mag. t. 5418, ic. sol. non descr.

Foliis ellipticis v. ovatis subtus eveniis glabris; corollæ tubo inferne intus glabro.

DISTRIB. Aden. Abundant on the hill crags, but now difficult to obtain. This is the form most often seen in cultivation.

A. multiflorum, Klotzsch in Peters' Mossamb. 279, t. 44.

Foliis oblongis obovatis subpetiolatis penniveniis venulis subtus conspicuis glabris; corollæ tubo inferne intus lineato-villoso.

DISTRIB. East tropical Africa (Mozambique) and Socotra.

A. somalense, Balf. fil.

Foliis sublinearibus glaucis lepidotis.

DISTRIB. Somali coast (1862). Playfair 3.

Order XLVI. ASCLEPIADEÆ.

A very large order of the warm regions of the world, some genera reaching temperate zones. In Socotra there are twelve genera, only two of which have a general distribution in both the old and new worlds; all the rest are old world species. Four of these range through Africa and tropical Africa, two of them reaching Australia; one, *Ectadiopsis*, is restricted to tropical and south Africa, and one, *Glossonema*, has this African distribution with an extension into Arabia; one, *Boucerosia*, is characteristic of the dry plains in the northern hemisphere from Spain to India, one, *Echidnopsis*, is an Abyssinian genus, and two are endemic.

1. ECTADIOPSIS.

Ectadiopsis, Benth. in Benth. et Hook. Gen. Pl. ii. 741.

A small genus of some five or six species, inhabiting east tropical and south Africa. Three of the species are Socotran, two being endemic, and probably the third also.

1. **E. volubilis**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 78. Tab. XLVII.

Fruticosa volubilis; foliis diversis ab forma lineari ad obovatam variantibus subsessilibus sæpe fasciculatis; cymis pedunculatis; floribus breviter pedicellatis.

Frutex volubilis ramis elongatis verrucosis glabris nodis tumidis internodiis elongatis, lateralibus sæpe contractis cicatricosis. *Folia* opposita sessilia v. subsessilia ad ramos contractos rosulato-fasciculata magnitudine formaque variantia, nunc linearia 4 poll. longa $\frac{1}{8}$ poll. lata, nunc oblanceolata v. anguste obovata 1 poll. longa $\frac{1}{2}$ poll. lata formasque intermedias exhibentia, apice in foliis angustis apiculata v. cuspidata, in latioribus plerumque obtusa emarginata et mucronata, margine integra subrevoluta supra nitida subtus opaca subglauca venulosa. *Cymæ* pedunculatæ axillares paucifloræ rhachi $\frac{1}{4}$ poll. longa valida breviter puberula; bracteolæ ovatæ margine membranaceo-ciliatæ; pedicelli $\frac{1}{12}$ poll. longi. *Calyx* $\frac{1}{10}$ poll. longus basi intus 5-glandulosus, segmentis ovatis acutis subcarinatis. *Corolla* flavescente-alba $\frac{1}{4}$ poll. longa, tubo brevi, lobis angustis obtusis. *Coronæ* squamæ ad orem corollini tubi attingentes clavatæ medio tubi affixæ. *Antheræ* glabræ acutæ, corpusculorum appendicibus oblanceolatis tenuissimis. *Stigma* pileiforme umbonatum obscure 2-lobatum. *Folliculi* divaricati $1\frac{1}{2}$ poll. longi crassiusculi acuti striati. *Semina* comosa $\frac{1}{3}$ poll. longa.

Nom. Vern. Ekkehin (Schweinf).

Socotra. Common. B.C.S. nn. 259, 696. Schweinf. nn. 472, 667.

Distrib. Endemic.

This and the following species are interesting Asclepiads, taking their position in this genus more naturally than in any other amongst the *Periploceæ*. From the type, however, they differ in having longer corona scales, and the dilated extremity of the scale tapers upwards to a point, reaching quite to the mouth of the corolla tube. With the south African *Curroria* they have a near affinity, but the form of the corpuscular appendages exclude them from it.

This species is unique in the genus, on account of its twining habit. All the others are erect shrubs.

It is very common on both limestone and granitoid regions of the island, and exhibits a strongly marked heterophylly, the leaves passing from very narrow long and linear forms, as in most of n. 259, through narrowly lanceolate or oblanceolate shapes, as in many of Schweinfurth's specimens, until we find, as in our n. 696, leaves short and distinctly obovate, three or four times as broad as the linear ones.

2. **E. brevifolia**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 78.

Fruticosa rigida erecta foliis sparsis brevibus sessilibus sæpe fasciculatis oblongis v. obovatis obtusis emarginatis mucronatis v. apiculatis; cymis sessilibus; floribus brevissime pedicellatis.

Frutex lignosus ramis rigidis verrucosis glabris sæpe ad apicem marcidis et subspinosis laterales ramulos contractos gerentibus. *Folia* sessilia v. subsessilia sparsa ad ramulos contractos fasciculata oblonga v. oblongo-elliptica v. obovata v. oblanceolata basi angustata $\frac{5}{12}$-$\frac{2}{3}$ poll.

longa $\frac{1}{6}$–$\frac{1}{4}$ poll. lata coriacea supra viridia sæpe medio panno rubro notata subtus glauca pulverulenta. *Flores* in cymas sessiles 2-3-floras ad apices ramulorum contractorum dispositi; pedicellis brevissimis pubescentibus; bracteis minutis ovatis. *Calyx* $\frac{1}{12}$ poll. longus extus pubescens, segmentis late ovatis. *Corolla* $\frac{1}{5}$ poll. longa campanulata, lobis lineari-lanceolatis obtusis. *Coronæ* squamæ clavatæ parvæ incurvæ inclusæ medio tubo corollæ affixæ. *Antheræ* glabræ. *Pollen* granulosum appendicibus corpusculorum oblanceolatis tenuissimis. *Stigma* pileiforme umbonatum. *Folliculi* $1\frac{1}{4}$–$1\frac{3}{4}$ poll. longi. *Semina* elliptica $\frac{1}{4}$ poll. longa.

NOM. VERN. Gisso (B.C.S.).

Socotra. On the limestone plateau south-west from Galonsir, at an elevation of over 1500 feet. Also in a few other like situations. B.C.S. nn 583, 615.

DISTRIB. Endemic.

Another species with a corona aberrant from the generic type in the same direction as the foregoing, though in habit it conforms with the type. This with its small coriaceous leaves readily distinguishes it.

We have another set of specimens, n. 99, collected near Galonsir, of a hard-wooded shrub, which is probably this species. But the lateral shortened branches project farther from the stems, and show very clearly the cicatrices of the fallen leaves; the leaves are shorter, more persistently oval, and almost invariably have the lamina on the upper face coloured dark red in the centre, there being only a small marginal circlet left green. The calyx on the single flower present on the specimens is rather smaller than those in the plant described last, and the corona scales are slightly longer; the flower being altogether not unlike that to which I next refer under n. 634.

3. Ectadiopsis sp.?

Socotra. Near Kadhab. B.C.S. n. 634.

We have another set of specimens of a plant, the exact position of which I am unable to determine, although I am inclined to consider it a form of *Ectadiopsis*. The characters are briefly these:—A small shrubby virgate plant, with many contracted lateral branches bearing tufts of leaves, and also many tawny-barked elongated twigs. Some of the leaves, notably those in the tufts, are like those of the Socotran species of *Ectadiopsis*, the others more nearly resemble those of the plant presently to be described, *Mitolepis intricata*. They are, however, never pubescent, but often pulverulent underneath, becoming glabrous. The flowers are peculiar. I have only found a single unbroken one upon the specimens, and it shows a calyx and corolla as in the foregoing species, stamens also alike only with the anthers somewhat ciliate, but the clavate corona scales are considerably longer than in *Ectadiopsis*, though not nearly so long as in *Mitolepis*. But the most remarkable feature in the specimens is the tendency to abnormality and phyllody in the flower. Perfect flowers with the character

I have indicated are rare, but there are many differing from that which must be the normal type. These are commonly borne at the extremity of an elongated twig or, at least, internode, and are readily observed, being twice the size of the normal flower. In some of them the calyx may be normal, and the corolla has a slightly dilated tube, constricted at the throat, where it is girt by a thickened and pubescent ring, and the segments of its limb are long and leaf-like; the corona scales are subulate, slightly inserted into the corolla tube above the oral constriction, exserted, and attain a length of a quarter of that of the limb of the corolla; there are no stamens, and in the centre of the flower is a pistil slightly compressed, and adherent to the corolla tube, thinning upwards into a sort of beak distinctly bilobed at the apex. But there are more extreme cases than that. In some flowers there is phyllody of all parts. We find a calyx, cup-shaped at base, with more or less green leafy lobes, a corolla of five leafy lobes, and rising from inside of it, and alternating with its lobes, five similar leaf-like bodies, which I assume represent the corona scales; in the centre is a couple of leaves connate at the base, and enclosing a cavity, and these I take to represent the carpels, and between them are visible two small processes which may be additional leaves on the axis. It appears, then, we have complete phyllody with suppression of the andrœcium. The five processes within the corolla lobes I take to be corona scales, for they occupy the position of these in the half-phyllodied flower. It is commonly accepted that the corona in Asclepiads is an emergence, so that in this instance we have emergences becoming themselves foliar. I know of no recorded instance of this in any other plant. In the Appendix I again refer to this subject.

2. MITOLEPIS.

Mitolepis, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 78.

Calyx 5-partitus, glandulosus, segmentis oblongis obtusis. Corolla campanulata, tubo brevi, lobis angustis linearibus obtusis contortis dextrorsum obtegentibus. Coronæ squamæ 5, basi fusiformes, apice filiformes, medio tubo corollæ affixæ qua paulum breviores. Stamina prope basin tubi affixa, filamentis liberis; antheræ erectæ, basi stigmati adhærentes, apice conniventes, acutæ, liberæ, dorso glabræ. Pollen granulosum appendicibus oblongo-ellipticis corpusculorum applicitum. Stigma depresso-conicum medio 2-lobum. Folliculi divaricati teretes striati subtiliter puberuli. Semina comosa.—Frutex erectus multiramosus. Folia opposita fasciculata linearia. Flores solitarii breviter pedicellati.

A monotypic genus of *Periploceæ,* having the corona scales attached to the corolla tube. It is thus a neighbour of such genera of shrubby habit as *Curroria, Æchmolepis, Ectadiopsis,* and *Ectadium.* But there are characters which prevent our plant being included in any one of these genera. Thus *Curroria,* a south African ditypic genus, is distinguished by the connate filaments of the stamens and by its orbicular appendages to the corpuscles.

Æchmolepis, a monotypic and imperfectly known genus from Angola, has sagittate corona scales, but from the description it is very closely allied to our plant. From *Ectadiopsis* the nonclavate exserted corona scales separate it; whilst the monotypic south African *Ectadium*, which is possibly its nearest affinity, has an urceolate or salver-shaped corolla, with subulate corona scales, the anthers cohering and villous on the back, and the inflorescence cymose. The small Madagascar genus *Pentopetia* has also many technical resemblances, but its habit and appendaged anthers differentiate it.

ETYM. μίτος, a thread, and λεπὶς, a scale.

M. intricata, Balf. fil. *loc. cit.* Tab. XLVIII.

Frutex 6-pedalis intricato-ramosa, ramis ultimis obscure puberulis glabrescentibus ramulos contractos gerentibus. *Folia* sessilia ad ramulos contractos fasciculata, mox decidua ¼-½ poll. longa ½ poll. lata linearia v. oblanceolata obtusa sæpe emarginata apiculata v. mucronulata revoluta crassa leviter pubescentia subtus subcanescentia. *Flores* inter folia fasciculati solitarii, pedicellis ⅛ poll. longis pubescentibus. *Calyx* ½ poll. longus extus pubescens, lobis lateraliter membranaceis apice suberosis. *Corolla* ¼ poll. longa extus glabra.

Socotra. On hills near Kadhab and Kischen. B.C.S. n. 508. Schweinf. n. 651.

DISTRIB. Endemic.

This plant loses its foliage very early. Our specimens were gathered from a bush in full flower which was almost destitute of foliage leaves. In many features it is not unlike our species of *Ectadiopsis*, but the technical characters of its corona and of the androecium are very different.

3. COCHLANTHUS.

Cochlanthus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 78.

Calyx urceolatus, alte 5-fidus, lobis longe acutis recurvis, intus basi 5-squamatus, squamis dentatis. Corolla campanulata alte 5-partitus, tubo brevi, segmentis angustis obtusis valide sinistrorsum contortis dextrorsum obtegentibus. Coronæ squamæ 5, tubo corollæ affixæ, breves, validæ, crassæ, apice 2-lobæ, basi leviter latiores, subcomplanatæ tubo corollæ æquilongae et supra gynostegium conniventes. Stamina intra coronam affixa, filamentis brevissimis distinctis; antheræ deltoideæ, stigmati adhærentes, conniventes apice in appendices breves subulatos abrupte reflexos productæ, imberbes. Pollen granulosum, corpusculorum appendicibus linearibus paulum concavis. Stigma late conicum vertice bilobum; ovula numerosa. Folliculi crassi breves oblongo-ovoidei leves divaricati. Semina comosa.—Frutex alte scandens. Folia opposita glabra. Cymæ in paniculas corymbosas pedunculatas terminales dispositi. Flores pedicellati.

A monotypic genus of *Periplocæ*, having some affinity with *Periploca* itself. From that genus, however, it is readily diagnosed by the corolla, corona-scales, and the glabrous anthers. There are two or three other African or Madagascar genera closely allied to *Periploca*, with which our genus has relations, notably

with the south African monotypic *Chlorocodon*. But that genus has dorsal appendages to the corona-scales, and the form of the scales in the other adjacent genera, *Raphionacme* and *Tacazza*, with other characters separates them. *Cryptolepis*, an African and tropical Asiatic genus, includes forms much like our plant in habit, and is closely allied, perhaps as closely as any other genus; but the stamens have long filaments, and the corona scales are inserted in the tube of the corolla at a distance from the filaments.

One of the most marked features in our plant is the contortion of the corolla, the edges of the petals forming a series of very prominent threads in a spire. Its other noteworthy characters are the stout bilobed corona scales, the anthers unbearded, and with reflexed apical appendages to the corpuscles, and the wide and short fruit. This in the present state of our knowledge of the family is a distinct genus, but it may prove to be a link connecting *Cryptolepis* with some of the other genera I have mentioned.

ETYM. κόχλος, a spiral shell or screw, and ἄνθος, a flower.

C. socotranus, Balf. fil. *loc. cit.* Tab. XLIX.

Frutex late scandens, ramis elongatis, ramulis tetragonis leviter puberulo-tomentosis. *Folia* sessilia elliptica v. late oblonga v. subrotundata 1¼–2 poll. longa 1–1½ poll. lata apice obtusa retusa v. emarginata mucronata basi subcordata margine obscure undulata crassiuscula pennivenia glabra glauca. *Paniculæ* corymbosæ 1¼ poll. diam. ramulis validis, bracteis subulatis minutis, pedicellis validis subtiliter pubescentibus $\frac{1}{10}$–$\frac{1}{8}$ poll. longis. *Calyx* ⅛ poll. longus extus subtiliter puberulus segmentis margine membranaceis. *Corolla* ½ poll. longa, lobis sursum angustatis ⅓ poll. longis. *Folliculi* 1½ poll. longi ½ poll. diam. *Semina* lagenæformia scrobiculata ⅙ poll. longa.

Socotra. On the Haghier hills, at an elevation over 3000 feet. B.C.S. n. 525.

DISTRIB. Endemic.

This is a very handsome shrub.

4. SECAMONE.

Secamone, R. Br., in Mem. Wern. Soc. i. 55; Benth. et Hook. Gen. Pl. ii. 746.

A small genus, including mostly twining species, natives of tropical and south Africa, the Mascarene Islands and Madagascar, tropical Asia and Australia. The Mascarene and Madagascar species form a very distinct section in the genus, and to it the Socotran plant belongs.

S. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 79. Tab. L.

Volubilis ramis ferrugineo-tomentosis; foliis obovatis; cymis subsessilibus; corollæ tubo intus lineari-villoso; stigmate capitato spongioso; folliculis breviter pubescentibus.

Frutex volubilis internodiis multo elongatis ramulis ferrugineo-tomentosis. *Folia* opposita petiolata ¾–1¼ poll. longa ⅓–½ poll. lata obovata apice emarginata v. rotundata et integra

sæpe mucronata basi gradatim attenuata margine integra late revoluta sæpe subsinuata coriacea opaca supra glabra subtus canescentia pennivenia nervo medio supra impresso subtus prominente venis immersis; petiolus $\frac{1}{5}$–$\frac{1}{4}$ poll. longus. *Cymæ* axillares subsessiles multifloræ foliis breviores. *Flores* brevissime pedicellati v. subsessiles, pedicellis ferrugineo-tomentosis. *Calyx* glandulosus $\frac{1}{10}$ poll. longus, segmentis obovatis margine membranaceis ciliatis dorso ferrugineo-tomentosis. *Corolla* extus glabra campanulata ad medium 5-fida, tubo intus lineis lunatis villosis limbi lobis alternantibus instructo, lobis limbi longe ovatis obtusis sinistrorsum obtegentibus. *Coronæ* squamæ staminibus basi adnatæ et inter se in parte triente inferiore connatæ superne liberæ lineares obtusæ tubo staminum æquilongæ et adpressæ. *Antheræ* cristatæ. *Ovarii* carpella 2 distincta semi-immersa; stylus inferne crassus, stigmate capitato mutico spongioso obscure bilobato; ovula multiseriata. *Folliculi* divaricati lineares teretes minute pubescentes $2\frac{1}{2}$–3 poll. longi. *Semina* linearia v. oblanceolata $\frac{1}{4}$ poll. longa.

Socotra. On the Haghier range and also near Dimux, at an altitude over 1000 feet. B.C.S. n. 179. Schweinf. n. 739.

Distrib. Endemic.

In most of the species of this genus the corolla lobes are dextrorsely imbricate, but in the Mascarene and Madagascar forms they are sinistrorse, and these southern Indian Ocean forms have also an almost sessile inflorescence, with the flowers closely aggregated, whilst in other members of the genus this is laxly branched. The Socotran plant is of interest in possessing features in these respects the same as the Mascarene and Madagascar species. With some forms from these islands it is very closely allied. Habit and foliage almost unite it with *S. obovata*, Dcne. (in DC. Prod. viii. 503), but that has an elongated apiculate style. Amongst forms with muticous styles *S. Thouarsii*, Dcne. (*loc. cit.* 502) apparently comes very near it, but I have not seen this species, and the short description given in the Prodromus leaves it difficult to identify; it is said to be glabrous, and to have the corolla tube slightly hairy at the base and apex,—characters not visible in our plant.

On Socotra our plant is by no means rare.

5. GLOSSONEMA.

Glossonema, Dcne. in Ann. Sc. Nat. sér. 2, ix. (1838), 335, t. 12, f. D, and in DC. Prod. viii. 554; Benth. et Hook. Gen. Pl. ii. 748.

A genus of six or seven species, natives of Arabia and tropical Africa, one species occurring in extratropical south Africa.

G. Revoili, Franch. Sert. Somal. in Miss. Révoil 40. t. 3.

Ad descriptionem Franchet adde—Folliculi $2\frac{1}{2}$-pollicares lati fusiformes appresse spinescentes, spinis $\frac{1}{6}$ poll. longis uncinatis. *Semina* stipitata superne orbicularia $\frac{1}{5}$ poll. diam. margine dentata.

Socotra. Galonsir and Hadibu plains and elsewhere. Not uncommon. B.C.S. 87. Schweinf. nn. 260, 315.

DISTRIB. Somali Land.

A very distinct species of this genus, as Franchet remarks. It resembles in its indumentum the Arabian *G. Boveanum*, Dcne. (in Ann. Sc. Nat. sér. 2, ix. (1838), 335, t. 12), but is easily distinguished by its larger leaves and different flowers. The flowers, it is worthy of remark, show corona-scales, linear-subulate throughout, not, as is typical of the genus, broad peltate scales with an apical flagellum.

From the Somali Land plant, as figured by Franchet, which I have seen in Paris, our plant varies slightly, having much longer and more incurved corona-scales and leaves not so persistently obovate. Our specimens enable us to complete the description of the species with fruit and seed characters.

6. CALOTROPIS.

Calotropis, R. Br. in Mem. Wern. Soc. i. 39; Benth. et Hook. Gen. Pl. ii. 754.

A ditypic genus; the species inhabiting the warmer parts of Asia and Africa.

C. procera, R. Br. in Ait. Hort. Kew. ii. 78; Dcne. in DC. Prod. viii. 535; Ach. Rich. Tent. Flor. Abyss. ii. 33; Boiss. Flor. Orient. iv. 57; Hook. fil. Flor. Brit. Ind. iv. 18; Wight Ic. t. 1278; Bot. Reg. t. 1792.

NOM. VERN. Öscher (Schweinf.).

Socotra. Common near Galonsir and elsewhere. B.C.S. n. 24.

DISTRIB. A widespread species from the Canary Islands through tropical Africa and south-west Asia to India. Introduced in the west Indies.

7. VINCETOXICUM.

Vincetoxum, Mönch. Meth. Bot. 717; Benth. et Hook. Gen Pl. ii. 761.

A large genus of erect or twining herbs or shrubs, chiefly found in temperate and warmer regions of the globe. More rare in the tropics.

V. linifolium, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 79. Tab. LI.

Volubile glaucum ramis flagelliformibus; foliis filiformibus; cymis extra-axillaribus lateralibus longe pedunculatis; corona 5-fida, lobis carnosulis obtusis.

Frutex volubilis glaucus ramis scopariis striatis glabris spiraliter inter se tortuosis ultimis flagelliformibus, internodiis elongatis sæpe 3 poll. longis. *Folia* opposita facile detersa, filiformia basi attenuata et subpetiolata 2 poll. longa v. minora crassiuscula glabra, juvenilia in axillis villosa. *Cymæ* racemosæ lateraliter extra-axillares, rhachi $\frac{1}{3}$–$\frac{2}{3}$ poll. longa tenui; pedicelli $\frac{1}{12}$–$\frac{1}{10}$ poll. longi capillares; bracteolæ minutiæ. *Flores* parvi. *Calycis* segmenta $\frac{1}{24}$ poll. longa acuta subcarinata. *Corollæ* lobi $\frac{1}{12}$ poll. longi late ovati obtusi. *Corona* alte lobata, lobis carnosulis obtusis antice jugo prominulo apice subdeltoideis et inflexis gynostegio brevioribus. *Stigma* planum vertice obscure umbilicato *Folliculi* lineares acuminati leves $2\frac{1}{2}$ poll. longi. *Semina* $\frac{1}{5}$ poll. longa.

Socotra. Not uncommon. B.C.S. n. 208.

Distrib. Endemic.

An interesting form amongst old world species on account of its habit. The narrow thread-like leaves on flagelliform twining and twisting branches, from which they are easily and soon displaced, gives the plant a leafless appearance, a feature seen in no old world species, though there is an approach to it in one Cape of Good Hope form.

On the other hand, in west Indian species of this habit, described by Grisebach (Flor. Brit. W. Ind. 417), under the generic name *Amphistelma* (reduced to *Vincetoxicum* by Bentham and Hooker), we find, in addition to the general likeness, that there is a great correspondence in the technical floral details. There is no identity in species from these almost antipodean localities, but it is interesting to note the development of the genus along the same special and exceptional lines in such widely separate areas.

8. SARCOSTEMMA.

Sarcostemma, R. Br. in Mem. Wern. Soc. i. 50; Benth. et Hook. Gen. Pl. ii. 763.

A genus of leafless fleshy plants, inhabitants of tropical and subtropical regions in Africa, Asia, and Australia. We have specimens of three species from Socotra, only one, however, is in a condition for identication, and is a Cape de Verde Island plant.

1. **S. Daltoni**, Dcne. in Webb Spicil. Gorgon. in Hook. Nig. Flor. 149, t. 14.

Socotra. In many places on the plains, especially abundant near Debeni. B.C.S. n. 525.

Distrib. Cape de Verde Islands.

Our plant so completely agrees in floral characters with this species, I am unable to distinguish between them. The follicles, however, are hardly so long as in the Cape de Verde Island plant. Species of this genus are awkward to preserve as herbarium specimens, and the leafless habit makes it difficult to identify fragmentary specimens; but, possibly it will be found that some forms, of which fragments have been brought from tropical Africa, and are now in Kew Herbarium, belong to this species, which may therefore range, as so many of the Atlantic Islands and Socotran plants do, across the African continent.

2. Sarcostemma sp.

Socotra. On the plains. B.C.S. n. 519.

A peduncle with a few flowers of a Sarcostemma is in our collection, but it is too fragmentary for identification.

3. Sarcostemma sp.

Socotra. On the plains. B.C.S. n. 527.

The stems of, apparently, another Sarcostemma are in our collection, but I have not been able to identify them.

9. DÆMIA.

Dœmia, R. Br. in Mem. Wern. Soc. i. 50; Benth. et Hook. Gen. Pl. ii. 764.

A small genus of twining species which have a wide range over Africa and tropical and subtropical Asia.

D. angolensis, Dcne. in Ann. Sc. Nat. sér. 2, ix. (1838), 337, and in DC. Prod. viii. 544.

D. œthiopica, Dcne in DC. Prod. viii. 544.
? Asclepias scandens, Beauv. Flor. O'Ow. et Ben. i. 93, t. 56.

Nom. Vern. Irrhăm (Schweinf.).

Socotra. Common. B.C.S. n. 64, 515. Schweinf. n. 676.

Distrib. Tropical Africa.

This is one of the commonest twiners on the plains, and a favourite food of camels.

The species appears to vary much. The follicles in our Socotran plant are sometimes quite smooth and pubescent, or there may be a slight roughness or murication of surface towards the base. Decaisne describes fruits of *D. angolensis* as smooth, but Palisot de Beauvois' figure shows a very spiny fruit, and I find in Kew Herbarium specimens from west tropical Africa with the fruit more or less spiny. As regards the flowers, Hooker (Nig. Flor. 454) notes two forms of the species, one, "having the corolla deep purple at the base with greenish-white divisions, is the more northern form found in Senegambia and Guinea, as far as Accra"; "the other, with larger leaves and a pure white corolla, extends from Cape Coast southwards." Our Socotran plant, like the first of these, has a purple corolla. Of continental forms our plant resembles most Æthiopian plants, which, however, have persistently scabrid as well as velutino-pubescent stems (in west African plants the stems are sometimes scabrid), and the fruit is almost invariably spiny, the spines being uncinate, whilst in our plants the scabridity is hardly marked on the stems, indeed I only find it on one specimen. It may be possible eventually to differentiate more than one species amongst these forms, but I have not been able to do so at present.

10. MARSDENIA.

Marsdenia, R. Br. in Mem. Wern. Soc. i. 28; Benth. et Hook. Gen. Pl. ii. 772.

A considerable genus of twining or shrubby plants, widely dispersed over the warmer regions of the globe. One species appears in the Mediterranean region.

M. robusta, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 79. Tab. LII.

Fruticosa robusta erecta ramulis petiolisque pubescenti-tomentosis; foliis cordatis v. ovatis obtusis; inflorescentiis petiolis brevioribus; corollæ laciniis oblongis obtusis, tubo intus dense villoso; stigmate rostrato obscure lobato; folliculis pubescentibus.

Frutex 6–8-pedalis robustus ramulis cicatricosis validis lenticellis verrucosis fulvo-tomentosis. *Folia* longe petiolata, lamina $1\frac{1}{2}$–$2\frac{1}{2}$ poll. diam. cordata v. subrotundata v. subreniformia v. late ovata obtusa apice basique nonnunquam angustata margine obscure undulata leviter pubescentia venis radiatis; petiolus 1–$1\frac{3}{4}$ longus. *Flores* in racemos axillares petiolo æquilongos v. breviores congesti, superiores solum fertiles; pedunculi $\frac{1}{5}$–$\frac{1}{4}$ poll. longi v. breviores tomentosi post anthesin aucti; pedicelli validi sulcati pubescentes $\frac{1}{6}$ poll. longi v. minores; bracteæ lineares pubescentes apice angustatæ $\frac{1}{9}$ poll. longæ. *Calyx* $\frac{1}{5}$ poll. longus, segmentis oblongo-lanceolatis obtusis v. acutis extus pubescentibus sæpe recurvis. *Corolla* $\frac{1}{4}$ poll. longa intus dense villosa, laciniis patulis elongato-ovatis obtusis. *Coronæ* squamæ gynostegio adpressæ eo breviores apice liberæ ovatæ. *Antherarum* membrana terminalis superne lineari-elongata. *Stigma* vertice conico rostrato apice obscure bilobato. *Folliculi* 2 poll. longi lignosi pubescentes non-alati. *Semina* elliptica $\frac{1}{4}$ poll. longa glabra.

Socotra. Near Galonsir and Kadhab. B.C.S. n. 522. Schweinf. n. 741.

Distrib. Endemic.

A species not very abundant on the island, marked out from all allied forms by its stout erect habit, and the very short inflorescences with crowded flowers in the axils of the leaves. The species from the adjacent mainland are mostly twiners with flowers arranged in longer peduncled and somewhat lax cymes.

11. ECHIDNOPSIS.

Echidnopsis, Hook. fil. Bot. Mag. t. 5930; Benth. et Hook. Gen. Pl. ii. 781.

A monotypic Abyssinian genus.

E. cereiformis, Hook. fil. *loc. cit.*

Apteranthes tessalata, Dcne. in Ann. Sc. Nat. sér. 5, xiii. (1870-1871), 406.

Socotra. On the limestone hills, north-west from Galonsir. B.C.S. n. 617.

Distrib. Of the genus.

We have specimens, neither with flower nor fruit, which may be referred to this remarkable species. Our plants are, however, considerably more delicate than the type as dried in Kew Herbarium, and the stems do not reach such a height, and it is possible it is not this species; but if not, it is very closely allied to it. This is the only Stapelioid plant that is eaten by the inhabitants.

12. BOUCEROSIA.

Boucerosia, Wight and Arn. Contrib. Bot. Ind. 34; Benth. et Hook. Gen. Pl. ii. 782.

A small genus of fleshy plants inhabiting dry plains of the northern hemisphere of the old world, extending from southern Spain eastwards to India.

Three species occur in Socotra, but of only one have we specimens sufficient for determination, and these show it to be endemic.

1. **B. socotrana**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 79.

Ramis tetraquetris marginibus angulato-sinuatis, lobis in spinas productis; corolla atro-sanguinea; corona alte 5-fida; segmentis apice trifidis, lobo medio minimo incurvo, lobis lateralibus erectis subulatis.

Erecta multo breviterque ramosa glauco-cinerea superne rubescente-pannosa, ramis tetraquetris marginibus angulato-sinuatis, angulis subcompressis lobatis, lobis spinis triangularibus brevibus paulum deflexis terminatis. *Flores* mediocri pauci versus extremitates ramorum dispositi pedicellati, pedicellis validis $\frac{1}{6}$ poll. longis. *Calyx* $\frac{1}{5}$ poll. longus, segmentis lanceolatis basi incrassatis margine membranaceis intus 5-squamatis. *Corolla* expansa $\frac{3}{4}$ poll. longa atro-sanguinea, lobis acutis $\frac{3}{10}$ poll. longis. *Corona* gynostegio affixa alte 5-fida, segmento singulo trilobato lobo medio minimo antheræ incumbenti adpresso lobis lateralibus subulatis erectis pilis deflexo-patentibus instructis. *Pollinis* massæ breves late ellipticæ. *Folliculi* 4–5 poll. longi $\frac{1}{4}$ poll. diam. glabri glauci. *Semina* $\frac{1}{4}$ poll. longa late marginata.

Socotra. Common on the limestone plains, and on hill slopes at low altitudes. B.C.S. n. 524. Schweinf. n. 740.

Distrib. Endemic.

A very distinct species, and remarkable in its corona, which is very deeply divided into five lobes, each of which has three apical prolongations—the scales of the inner and outer series. *B. sinaica*, Dcne. and *B. Aucheriana*, Dcne. (in DC. Prod. viii. 649) are near allies, but from the descriptions—I have not seen specimens—they appear to be different.

We brought this plant alive to this country, and it thrives at Kew, Edinburgh, and Glasgow, and I hope it will ere long flower, when it may be figured.

Boucerosia sp.

Socotra. Limestone hills west from Tamarida and near Galonsir. B.C.S. n. 585. Schweinf. n. 793.

Another species, possibly endemic. It is a small form with close set spines. As we have no flowers or fruit, it is not possible to match it. It is not common on Socotra. Schweinfurth sends it from near Tamarida. We found it on the hills near Galonsir.

Unfortunately we have no living specimens of this plant.

Boucerosia sp.?

Socotra. On the plains; occasional. B.C.S. n. 694.

Another of the *Stapelieæ*, probably a *Boucerosia*, but we have no flowers or fruit. Specimens of this we brought alive to this country are now growing at Kew, and its identity may therefore be ultimately determined from them.

Order XLVII. GENTIANEÆ.

A large family of annual or perennial herbs, rarely shrubby, dispersed over the whole world, but most abundant in mountainous temperate regions. Of the two Socotran genera, one is essentially Indian and east Asian, but reaches in one species tropical Africa, and the Mascarene Islands; the other has a wide range in the northern hemisphere.

1. EXACUM.

Exacum, Linn. Gen. n. 141; Benth. et Hook. Gen. Pl. ii. 803.

A small genus of some twenty-five species of mostly herbaceous plants with beautiful flowers. The majority are natives of India, but a few extend to China, and the Malay Archipelago. One occurs in tropical Africa and the Mascarene Islands. The three Socotran species are endemic.

1. E. cæruleum, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 80. Tab. LIII.

Suffruticosum humile glabrum; foliis sessilibus v. subsessilibus ovatis trinerviis; floribus pentameris magnis terminalibus solitariis v. in dichasia pauciflora dispositis; calycis lobis alatis; corollæ segmentis cæruleis ellipticis; antheris lateraliter ad medium dehiscentibus.

Suffrutex vix pedalis lignosus humilis glaber subprostratus multiramosus, caule tetragono ramisque brevibus tortuosis. *Folia* sessilia v. basalia subsessilia 1–1¼ (rarius 2½) poll. longa ½–⅔ (rarius 1) poll. lata ovata late acuta subamplexicaulia basi sæpe subcordata crasse coriacea trinervia nitida margine revoluta. *Flores* magni pentameri ad extremitates ramulorum solitarii v. in dichasia pauciflora aggregati pedicellati; pedicelli ¾–1 poll. longi erecti. *Calycis* lobi late ovati acuminati ⅕ poll. longi anguste alati, alis sub fructu auctis. *Corollæ* segmenta elliptica obtusa cærulea ⅙ poll. longa. *Antheræ* ⅙ poll. longæ sursum leviter attenuatæ et incurvatæ lateraliter ad medium dehiscentes. *Stylus* ovario duplolongior apice subcircinatus. *Capsula* globosa ⅕ poll. longa.

Socotra. On the higher parts of the Haghier hills, at an elevation of 2500 feet. B.C.S. n. 403. Schweinf. n. 672.

Distrib. Endemic.

A small woody plant with lovely blue flowers. We only found it on the top of the Sicante Peaks, south from Tamarida, but Schweinfurth has it from above Kischen, so that it probably occurs over the whole Haghier range.

It is quite distinct as a species belonging to the pentamerous section of the genus. It has resemblance with the Ceylon species *E. Walkeri* (Arn. in Griseb. Gent. 110, and in DC. Prod. ix. 45), but is quite different from it. The woody suffruticose habit is somewhat exceptional in the genus.

2. E. affine, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 80; Regel Gartenflora xxxii. (1883), 34, t. 1108; Hemsl. in Gard. Chron. xix. (1883), 368.

Annuum erectum ramosum; foliis ellipticis v. ovatis acutis longe petiolatis 5-nerviis; floribus pedicellatis cernuis 5-meris; calycis lobis late alatis; corollæ lobis obovatis violaceis; antheris ad apicem dehiscentibus.

Herba annua erecta copiose ramosa sesquipedalis, caule rubro subtereto, ramis tetragonis. *Folia* petiolata elliptica v. ovata acuta basi plerumque abrupte in petiolum lamina longiorem attenuata 2½–3 poll. longa 1–1½ poll lata subcrassa glabra 5-nervia. *Inflorescentia* dichasialis foliosa erecta. *Flores* 5-meri mediocri cernui pedicellati; pedicelli subtiles 1 poll. longi. *Calycis* lobi lanceolati acuminati dorsaliter late carinato-alati, carinis v. alis rugosis rotundatis. *Corollæ* segmenta obovata margine undulata $\frac{5}{12}$ poll. longa violacea *Antheræ* flavæ oblongæ ⅛ poll. longæ sursum vix attenuatæ incurvatæ maturitate ad apices dehiscentes. *Capsula* subglobosa ⅙ poll. diam.

Socotra. Not at all uncommon beside the streams. B.C.S. n. 82. Schweinf. n. 466.

Distrib. Endemic.

A beautiful species quite distinct from, but closely allied to *E. petiolare*, Griseb. (in DC. Prod. ix. 46), a plant of the Indian Peninsula. In habit and foliage the plants are extremely alike, but our plant has pentamerous not tetramerous flowers, its petaline lobes do not diminish upwards, and the calyx wings in fruit are more rounded. Its flowers, too, are always violet, not white as is typical of the Indian species.

The Socotran plant has been successfully raised, from seed sent by Schweinfurth, by Messrs Haage and Schmidt at Erfurt, and a plant which flowered with them is figured by Regel in the *Gartenflora*. He, however, is mistaken in describing the leaves as three-nerved. In our dried specimens and in Schweinfurth's, they are distinctly five-nerved, the outermost veins being close to the margin of the leaf. It is a pretty plant for cultivation.

3. **E. gracilipes**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 80.

Annuum erectum ramosissimum; foliis lanceolatis acutis petiolatis 3-nerviis; floribus graciliter pedicellatis cernuis 5-meris; calycis lobis anguste alatis; corollæ lobis obovatis cæruleis; antheris ad medium lateraliter dehiscentibus.

Herba annua erecta fastigiatim a basi ramosissima, caule subtetragono, ramis tetraquetris in inflorescentiam copiose dichasialiter ramosam excurrentibus. *Folia* lanceolata acuta 1–1¼ poll. longa ⅓–½ poll. lata basi in petiolum brevem attenuata margine revoluta crassiuscula glabra. *Flores* 5-meri cernui ad apices pedicellorum gracilium ¾ poll. longorum. *Calycis* laciniæ ⅙ poll. longæ acuminatæ dorsaliter anguste alatæ, ala semilunari oblique rugosa *Corollæ* lobi obovati obtusi ⅖ poll. longi cærulei. *Antheræ* flavæ oblongæ sursum vix attenuatæ et incurvatæ, loculis lateraliter ad medium dehiscentibus. *Capsula* globosa ⅛ poll. diam.

Socotra. On dry spots of the hill slopes. B.C.S. n. 84.

Distrib. Endemic.

Possibly this finds a near ally in *E. pedunculatum*, Linn. (Griseb. in DC. Prod. ix. 46), an Indian plant of considerable distribution, from which, however, amongst other characteristics, the pentamerous symmetry, which it possesses in common with the other Socotran species, separates it. With the foregoing species it has many points of resemblance, but is altogether a smaller and

more delicate plant, with a closely fastigiate habit. It is essentially a plant of dry spots.

2. ERYTHRÆA.

Erythræa. L. C. Rich. in Pers. Synops. i. 283; Benth. et Hook. Gen. Pl. ii. 809.

A small genus of variable herbs, characteristic of north temperate and subtropical regions, but some occur within the tropics, and extend even to Chili and Australasia.

E. Centaurium, Pers. Synops. i. 283; Griseb. in DC. Prod. ix. 58; Boiss. Flor. Orient. iv. 68; Syme Eng. Bot. t. 909.

Socotra. Abundant on the hill slopes. B.C.S. n. 286.

Distrib. Europe, north Africa, and south-west Asia. Very widely spread.

Order XLVIII. BORAGINEÆ.

A very large family widely dispersed over the world. The Socotran members of the family are referable to five genera, of which one is endemic, three are genera inhabiting the warmer regions of both old and new worlds,—one of them also reaching into temperate latitudes,—whilst the fifth is African and Asiatic, extending in one species to Australia.

1. CORDIA.

Cordia, Linn. Gen. n. 256; Benth. et Hook. Gen. Pl. ii. 838.

A large genus of about two hundred species of trees and shrubs spread throughout the warmer regions of the globe, but most abundant in America. Two of the Socotran species are endemic, and the third is a plant of south-west Asia and north-west Africa.

1. C. obovata, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 80.

Arborea; foliis petiolatis obovatis v. oblongo-obovatis apice obtusis et dentato-crenatis basi cuneatis subtus subscabridulis supra tuberculatis; cymis paucifloris terminalibus; pedicellis validis brevissimis; floribus mediocris 4-fidis; calyce enervio extus dense pubescente sub fructu cupulæformi glabro; corolla omnino glabra; fructu aurantiaco ovoideo 1–3-loculari.

Arbor parva cortice griseo ramulisque ultimis pubescentibus sed in plantis juvenilibus hispidis *Folia* petiolata obovata v. oblongo-obovata v. subelliptica, juvenilia sæpe subrhomboidea, obtusa sæpe subtruncata v. rarissime subacuta margine in parte superiore dentato-crenata v. acute dentata a medio ad basim integra cuneato-attenuata basi inæquilateralia 2–3 poll. longa 1–1½ poll. lata v. majora glabrescentia supra tuberculis albis vestita subtus pallidiora substrigulosa v. hispida v. subscabridula, petiolo concolore ¼–⅔ poll. longo supra canaliculato strigoso glabrescente. *Gemmæ* axillares pubescente-tomentosæ. *Cymæ* terminales pauciforæ parvæ densæ; pedicelli brevissimi validi. *Flores* mediocri. *Calyx* enervius nonsulcatus ⅕ poll. longus dentatus intus sericeo-villosus extus dense pubesc-

ente-tomentosus, sub fructu auctus cupulæformis $\frac{1}{3}$ poll. diam. extusque glaber. *Corolla* infundibularis 4-partita omnino glabra, tubo $\frac{1}{6}$ poll. longo, limbi lobis oblongis v. obcuneatis obtusis reflexis tubo æqualibus. *Stamina* exserta, filamentis corollæ limbo multibrevioribus. *Fructus* aurantiacus ovoideus glaber $\frac{3}{4}$ poll. longus 1–3-locularis putamine tetragono extus rugoso. *Testa* papyracea.

Nom Vern. Abēteh.

Socotra. A common tree. B.C.S. nn. 277, 427. Schweinf. nn. 379, 407 in lit.

Distrib. Endemic.

A distinct species in the section *Myxa* of this genus, but very closely allied to *C. crenata*, Del. (Fl. Ægypt. 51. t. 20. f. i.), a plant described as cultivated near Cairo, and of which the native country is unknown, though Boissier (Flor. Orient. iv. 124) remarks in a note to his description of *C. Myxa*, Linn., that Delile's plant is probably a native of the region about Mascate. From this species our Socotran plant differs in the pubescent buds and slightly hispid young leaves, the smaller and more compact cymes, the densely pubescent calyx in flower, and the glabrous corolla, besides having shorter stamens and a larger fruit. In general appearance there is, however, considerable similarity.

With *C. ovalis*, Hochst. (in herb. Schimp. Abyss. sect. ii. n. 1218),—to which *C. ovalis*, R. Br. (in Salt Abyss. app.), is probably correctly referred by De Candolle (Prod. ix. 479), though Ach. Richard (Tent. Flor. Abyss. ii. 82) is undoubtedly wrong in taking this plant to be *C. Myxa*, Linn.,—there are many points of resemblance in the Socotran specimens, but the Abyssinian species is more scabrid, and by other technical characters is easily distinguished.

On Socotra the tree is very common, and its fruit is one of the few edible ones on the island.

2. **C. obtusa**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 80.

Arborea; foliis petiolatis ellipticis v. elliptico-obovatis obtusis v. late acutis integris glabris siccitate nigricantibus; cymis pseudo-axillaribus paucifloris; pedicellis validis brevibus; calyce sub fructu cupulæformi glabro; drupa ovoidea aurantiaca 1-loculari.

Arbor parva, cortice griseo, fere omnino glabra simpliciter ramosa, ramulis ultimis striatis. *Folia* petiolata elliptica v. elliptico-obovata obtusa v. late acuta integra v. apice obscure crenata basi æquilateralia sæpe subcuneata coriacea siccitate nigricantia $1\frac{3}{4}$–$2\frac{1}{4}$ poll. longa $\frac{3}{4}$–1 poll. lata, petiolo concolore $\frac{1}{4}$–$\frac{2}{3}$ poll. longo canaliculato. *Gemmæ* pubescentes. *Cymæ* pseudo-axillares pauciforæ, rhachi primaria petiolo breviore; pedicelli sub fructu validi breves. *Flores* ignoti . . . . . *Calyx* sub fructu cupulæformis trilobatus $\frac{2}{5}$ poll. diam. glaber coriaceus. *Drupa* $\frac{3}{4}$ poll. longa ovoidea abortu 1-locularis.

Socotra. On the hills near Galonsir. B.C.S. n. 325.

Distrib. Endemic.

I have described this species on some fragmentary specimens which I have not been able to identify with a described form. It resembles somewhat the

foregoing species, but its glabrous, smooth, usually entire, leaves, and the shortly stalked inflorescences, exclude it from the other species in the section *Myxa* to which it belongs. Until better specimens are obtained it must remain an unsatisfactory species.

3. C. Rothii, Rœm. et Schult. Syst. iv. 798; DC. Prod. ix. 480: Clarke in Hook. Flor. Brit. Ind. iv. 138; Wight Ic. t. 1379.

C. oblongifolia, Hochst. in herb. Schimp. Abyss. sect. ii. n. 789.
C. subopposita, DC. Prod. ix. 480; Ach. Rich. Tent. Flor. Abyss. ii. 81.
C. quercifolia, Klotzsch in Peters' Mossamb. Bot. 247. t. 43.
Cornus sanguinea, Forsk. Fl. Ægypt. Arab. 33, (fid. DC.).

Socotra. On the Haghier range. Not common. B.C.S. n. 186.

Distrib. Nile Land, Mozambique, Scindh, and western India.

We have fragmentary specimens of a plant which appears to be this species. Unfortunately neither flowers nor fruit are present on our specimens; these are only the bases of the flower panicles remaining upon leafy shoots.

The species, as it grows on the dry plains of Scindh and in Abyssinia, is a much more woody and rigid plant than it is in the regions of south tropical Africa and western India. Our plant resembles most the Scindh form.

2. EHRETIA.

Ehretia, Linn. Gen. n. 257; Benth. et Hook. Gen. Pl. ii. 840.

A considerable genus of trees and shrubs inhabiting the warmer regions of both old and new worlds, but most abundant in the old world.

1. E. obtusifolia, Hochst. in herb. Schimp. Abyss. sect. ii. n. 652; DC. Prod. ix. 507; Ach. Rich. Tent. Flor. Abyss. ii. 83; Boiss. Flor. Orient. iv. 124; Clarke in Hook. Flor. Brit. Ind. iv. 142.

E. obovata, R. Br. in Salt Abyss. app.

Socotra. On the hills. B.C.S. n. 177. Schweinf. n. 478.

Distrib. Abyssinia, Scindh, Beloochistan.

We only obtained this tree in leaf, and our specimens only admitted of our referring the plant doubtfully to this genus. Schweinfurth sends specimens in flower which enable us to complete the identification.

2. Ehretia sp.

Socotra. On the hills. B.C.S. n. 717.

We have specimens without flower and fruit of a small shrub which is evidently an *Ehretia* and allied to *E. buxifolia,* Roxb. (Cor. Pl. i. 42, t. 57; DC. Prod. ix. 509; Clarke in Hook. Flor. Brit. Ind. iv. 144), but they are too fragmentary for exact determination.

3. HELIOTROPIUM.

Heliotropium, Linn. Gen. n. 179; Benth. et Hook. Gen. Pl. ii. 843.

A large genus of herbs or shrubby plants ranging through the warmer and temperate regions of the world. Of the nine Socotran species, three are endemic, four are plants confined to tropical Africa and south-west Asia, the remaining two, whilst essentially tropical African and south Asiatic species, reach also to Australia.

1. **H.** (Catimas) **zeylanicum**, Lamk. Illustr. i. 393; Clarke in Hook. Flor. Brit. Ind. iv. 148; Wight Ic. t. 892.

H. hirtum, Heyne in herb. Rottler.

H. curassavicum, var. *zeylanicum*, Burm. Flor. Ind. 41, t. 16. f. 2.

H. fruticosum, Forsk. Fl. Ægypt. Arab. 38.?

H. subulatum, Hochst. in herb. Kotsch. Nub. n. 163.

Tournefortia subulata, Hochst. in herb. Schimp. Arab. sect. ii. n. 1285; DC. Prod. ix. 528; Ach. Rich. Tent. Flor. Abyss. ii. 83.

T. zeylanica, Wight Illustr. t. 170.

Socotra. On the Haghier hills. B.C.S. n. 534. Schweinf. nn. 499, 682 in lit.

Distrib. India, Scindh, Arabia, and tropical Africa.

Like other Heliotropes this species varies much in clothing. Our specimens from Socotra are very hispid; those of Schweinfurth are much less so.

2. **H.** (Monimantha) **dentatum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 81. Tab. LIV, A.

Annuum ramulis a collo patentibus; foliis linearibus v. lineari-lanceolatis dentatis hispidis inflorescentiis laxe ramosis paucifloris; corollæ tubo calyce longiore; styli lobis non exsertis; nucibus glabris.

Herba parva a collo multiramosa ramis hispidis patentibus adscendentibus in inflorescentias tenues ramosas deliquescentibus. *Folia* angusta oblanceolata v. lineari-lanceolata v. linearia apice obtusa sæpe leviter expansa basi gradatim in petiolum tenuem attenuata, basalia $2\frac{1}{2}$ poll. longa $\frac{1}{6}$ poll. lata, superiora multo minora, hispida margine dentata. *Inflorescentia* laxe ramosa basi bracteata, ramis gracilibus plerumque extra-axillaribus basi non floriferis apice pauci (sæpe 1–2)-floris, floribus sessilibus v. breviter pedicellatis scorpioideo-dispositis plerumque ebracteatis. *Calyx* $\frac{1}{12}$ poll. longus fere ad basim partitus, segmentis lineari-lanceolatis extus hirsutis. *Corollæ* albæ limbus induplicatus 5-fidus, lobis elliptico-rotundatis obtusis obscure crenulatis, tubo $\frac{1}{8}$ poll. longo intus glabro extus strigoso-pubescente. *Stamina* medio tubo affixa; antheræ ad orem corollini tubi attingentes ovatæ apice vix appendiculatæ. *Ovarium* glabrum; styli parte inferiore $\frac{1}{24}$ poll. longa, superiore longiore infra conica et apice in ramulos duos filiformes puberulos fissa non exserta. *Fructus* in nuculas 4 glabras tuberculatas solvens.

Socotra. On the plains about Galonsir, Tamarida, and elsewhere. B.C.S. n. 40. Schweinf. nn. 781, 789.

Distrib. Endemic.

An interesting species on account of its deeply bifid style. This is not a

common feature in the genus, but is found in another old world species *H. Ophioglossum*, Stocks (in Aitch. Punj. Cat. 94; Boiss. Flor. Orient. i. 145), a plant of Scindh and Beloochistan, and also of Somali Land, whence it was brought by Révoil, and is described and figured as a new species, *H. stylosum*, by Franchet (Sert. Somal. in Miss. Révoil 45. t. 4, non *H. stylosum*, Philippi). With this species our plant has its nearest affinity, but its less woody character, narrow dentate leaves, few flowered cymes, and longer corollas with enclosed styles, distinguish it.

Franchet has with justice created a new section, *Monimantha*, of the genus, for the Somali Land plant, though the nomenclature is hardly happy, and into this section our plant also goes. The section has been adopted by Clarke (in Hook. Flor. Brit. Ind iv. 149).

3. **H. undulatum**, Vahl Symb. i. 13; DC. Prod. ix. 536; Boiss. Flor. Orient. iv. 147; Clarke in Hook. Flor. Brit. Ind. iv. 150.

H. ramosissimum, Sieber. exsicc. Ægypt.; DC. Prod. ix. 536.
H. crispum, Desf. Flor. Atl. i. 151, t. 41.
H. persicum, Lamk. Dict. i. 393; DC. Prod. ix. 537; Boiss. Flor. Orient. iv. 147.
H. marocanum, Lehm. Asper. 56; DC. Prod. ix. 536.
Lithospermum hispidum, Forsk. Fl. Ægypt. Arab. 38.

Socotra. Very common. B.C.S. nn. 6, 49, 185, 536. Schweinf. n. 787. Nimmo.

Distrib. North Africa and south-west Asia.

A widely distributed species, exhibiting a vast number of forms. We have four sets of specimens from Socotra, and most of them are more thickly clothed with hairs than is common in the species.

Those numbered 6 and 49 agree in habit, being closely branched, compact, woody, prostrate plants, with small leaves and throughout densely hispid, on the younger parts silkily so. The inflorescences are clustered; the calyx 5-partite with segments hispid externally; the corolla, which is whitish in n. 6, citron yellow in n. 49, is cut nearly half way down, and is externally strigulose-hispid; the anthers are oblong-ovate and have a small apiculus; the stigmatic portion of the style is pyramidal, longer than the basal part and in n. 6 is slightly strigulose, in n. 49 is quite glabrous. No specimens of the species in Kew Herbarium are exactly like this form, but I can fix on no technical characters by which to differentiate it.

Our n. 185, Schweinfurth's n. 787, is a plant with ascending branches and larger leaves, thoroughly hispid. The calyx is deeply divided and densely hispid; the corolla, which is citron yellow and is pubescent, has a limb the lobing of which extends through only a quarter of its length; the anthers are ovate and gradually narrow upwards into longish points; the stigmatic surface is conical, longer than the basal part, and covered with long appressed hairs.

Dr Nimmo's plant in Kew Herbarium is of this form, and there is also a similar plant in Kew Herbarium brought by Major Madden from the neighbourhood of Suez.

N. 536 is a much less hispid form, except on the very young buds, and the tuberculation of the leaves, which are much larger than in our specimens, is evident. The deeply cut calyx is shortly hispid; the limb of the corolla is cut through a third of its extent; the anthers are oblong-ovate, and at the apex, end abruptly and bear a small cusp; the stigmatic part of the style is hairy, and is equal in length to the basal portion. This form is not unlike specimens of the plant from Yemen collected by Bové.

There is a plant in Kew Herbarium brought from Nubia by Schweinfurth, and labelled by him *Lithospermum lignosum* (n. 2111), which is a Heliotropium, nearly allied to, if not identical with, the species under consideration, and especially with the form of it last referred to. The differences it exhibits are these,—the calyx is divided through half or three-quarters of its length, and the segments are somewhat blunt, rather pubescent than hispid; the corolla is but slightly pubescent externally, and the basal part of the style is much shorter than the hairy upper stigmatic portion.

I have contented myself with merely indicating the features of the Socotran forms, including them in this species without attempting to constitute varieties. How far it is possible to recognise varieties, or to break up this assumed species into a series of nearly allied species, is a question that can only be settled after an examination of a more extended set of specimens than I have been able to see.

4. **H. rariflorum,** Stocks in Hook. Kew Journ. Bot. iv. (1852), 174; Boiss. Flor. Orient. iv. 144; Clarke in Hook. Flor. Brit. Ind. iv. 152.

Lithospermum leucophlœum, Schweinf. in herb. Afr. Cent. n. 696.

Socotra. On the Haghier range near Tamarida. B.C.S. n. 627. Schweinf. n. 439.

Distrib. Scindh, Beloochistan, Nubia.

An interesting species in respect of its flowers, which have the corolline lobes distinctly hooded, and the stamens with very small anthers inserted at the top of the corolline tube; the stigma, too, is very small, spongy, and capitate. Another interesting feature is the papery bark, which, white at first, peels off in layers, the under layers being of a dark reddish-brown. The fruit in the Scindh plant has a clothing of bristling hairs, and the Nubian specimens exhibit this also. In some of our plants the hairs on the fruit are quite appressed.

5. **H. (Heliophytum) pterocarpum,** Hochst. et Steud. in herb. Schimp. Arab. n. 835.

Heliophytum pterocarpum, DC. Prod. ix. 552.

Socotra. On the slopes of Haghier. B.C.S. n. 535.

Distrib. Arabia, Nubia, Senegal.

A species of considerable distribution in tropical Africa and south-west Asia, but commonly confounded with *H. undulatum*, Vahl, from which it is easily distinguished by the fruit splitting into two parts, each of which is two celled, and has both margins broadly winged.

6. H. (Heliophytum) **odorum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 81.

Suffruticosum plus minusve scabrido-puberulum; foliis alternis petiolatis oblongis v. oblongo-ovatis basi subcuneatis; spicis conjugatis ebracteatis; fructu bifido, pyrenis bilocularibus bispermis.

Suffrutex ramis longis ramosis, ramulis scabrido-puberulis, ultimis striatis. *Folia* alterna petiolata 1¼-2 poll. longa ½-¾ poll. lata oblonga v. oblongo-ovata v. oblongo-elliptica obtusa basi subcuneata sæpe inæquilateralia margine irregulariter erosa v. obscure crenulato-undulata reticulato-venulosa scabridula subtus pallidiora; petiolus ¼-½ poll. longus canaliculatus scabrido-puberulus. *Inflorescentiæ* extra-axillares sæpe oppositifoliæ rarius axillares, rhachi primaria ½-1 poll. longa scabrido-puberula bifida spicas conjugatas ebracteatas 2–3 poll. longas sparsim scabridulas gerente. *Flores* sessiles secundi. *Calyx* ⅙ poll. longus fere ad basim in segmenta linearia apice triangularia crassa pilis patentibus paucis vestita partitus. *Corolla* extus strigulosa alba, tubo intus glabro basi glanduloso calyci æquilongo, limbi parvi lobis obovatis v. rotundatis crenulatis. *Stamina* infra medium tubum affixa; antheræ oblongæ obtusæ. *Discus* conspicuus lobatus. *Ovarium* glabrum; stylus omnino glaber, parte stigmatica biloba parti inferiori æquilonga. *Fructus* bifidus, pyrenis 2-locularibus loculis 1 spermis ⅒ poll. longis glabris leviter rugosis nonalatis sulco medio lævi dorsali apice breviter bicornutis.

Nom. Vern. Hamhamo (B.C.S.).

Socotra. On the Haghier hills. Not uncommon. B.C.S. n. 181. Schweinf. nn. 221 in lit., 461.

Distrib. Endemic.

Nearly allied to the widely spread *H. indicum*, Linn. (Sp. 187; Bot. Mag. t. 1837). It may, however, be readily distinguished from that species by its clothing, which is not woolly, its leaves, which are never cordate at the base, and by its fruit, which is much smaller with non-mitriform segments.

H. longiflorum, Hochst. et Steud. (in Herb. Schimp. Arab. n. 842), a well known Arabian species is also a neighbour.

7. H. (Orthostachys) **ovalifolium**, Forsk. Fl. Ægypt. Arab. 38.

H. coromandelianum, Retz. Obs. ii. 9; DC. Prod. ix. 541; Ach. Rich. Tent. Flor. Abyss. ii. 84; Wight Ic. t. 138.

H. Kunzei, Lehm. Ic. Asp. 19, t. 29; DC. Prod. ix. 541; Boiss. Flor. Orient. iv. 130.

H. nilóticum, DC. Prod. ix. 541.

H. villosum, Sieber. exsicc. Ægypt.

Socotra. On the plains. B.C.S. n. 533.

Distrib. Tropical Africa, south-west Asia, India, and Australia.

The Socotran plant is the large-leaved form of the species, the true *H. ovalifolium*, Forsk.

8. **H.** (Orthostachys) **strigosum**, Willd. Sp. i. 743; DC. Prod. ix. 546; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 25; Boiss. Flor. Orient. iv. 143; Clarke in Hook. Flor. Brit. Ind. iv. 151.

H. laxiflorum, Roth. Nov. Pl. Sp. 102; DC. Prod. ix. 548.
H. bracteatum, R. Br. Prod. 493; DC. Prod. ix. 547; Clarke in Hook. Flor. Brit. Ind. iv. 151.
H. bicolor, Hochst. et Steud. in herb. Schimp. Arab. n. 848; DC. Prod. ix. 546; Ach. Rich. Tent. Flor. Abyss. ii. 85.
H. brevifolium, Wall. Cat. 914; DC. Prod. ix. 546.
H. zeylanicum, Wall. Cat. 2091.

Socotra. On the plains. B.C.S. n. 531. Schweinf. n. 282 in lit.

Distrib. Southern Asia, tropical Africa and Australia; widely spread.

The specific name above cited is to be regarded as a convenient one under which to group a multiplicity of forms described by various botanists as distinct species, of which a partial list is given. The forms run into one another so completely that specific diagnoses seem to me of doubtful value.

Our n. 351 may be considered as very near the type, and resembles much the forms growing at Aden and in Arabia generally. Besides it, we have two other forms which I refer to the following varieties.

var. **scabrum.**

H. scabrum, Retz. Obs. ii. 8; Clarke in Hook. Flor. Brit. Ind. iv. 152; Wight Ic. t. 1389.

Socotra. On the plains. B.C.S. n. 552. Schweinf. nn. 391 in lit., 790.

One of the most distinct forms, by its tufted habit and somewhat rosulate leaves.

var. **marifolium.**

H. marifolium, Retz. Obs. ii. 8; DC. Prod. ix. 547 (excl. syn.); Clarke in Hook. Flor. Brit. Ind. iv. 152; Wight Ic. t. 1390.

Socotra. On the plains. B.C.S. n. 553.

A very fragmentary specimen, probably of this form, which is characterised by having slightly larger flowers and longer bracts than the preceding.

9. **H.** (Orthostachys) **nigricans**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 81. Tab. LIV, B.

Suffruticosum intricato-ramosum decorticans ramulis strigosis angulosis; foliis suboppositis breviter petiolatis parvis ab forma elliptica ad formam obovatam variantibus nigricantibus strigosis; inflorescentiis paucifloris bracteatis; corollæ tubo calyci æquilongo, limbo magno; stigmate truncato vix bilobato; nuculis scabridis.

Suffrutex lignosus intricato- multoque ramosus, cortice glauco albido papyraceo erumpente, ramulis ultimis brevibus 2–4 poll. longis internodiisque sursum dilatatis complanatis strigosis. *Folia* parva opposita v. subopposita breviter petiolata elliptica v. subrotundata

v. oblonga rarius obovata obtusa v. emarginata rarius subacuta $\frac{1}{4}$–$\frac{5}{12}$ poll. longa $\frac{1}{6}$ poll. lata v. sæpe minora margine integra subrevoluta coriacea breviter strigosa siccitate nigricantia decidua. *Flores* ad extremitates ramulorum dispositi sympodia scorpioidea bracteata brevia formantes pedicellati extra-axillares, in quoque ramulo pauci sæpe 1–2; pedicelli $\frac{1}{2}$ poll. longi; bracteæ foliosæ. *Calyx* $\frac{1}{10}$ poll. longus alte 5-partitus, segmentis subulatis crassis extus strigosis basi paulum membranaceo-marginatis. *Corollæ* limbus fere $\frac{1}{6}$ poll longus tubo longior, lobis late ovatis acutis obscure crenulatis extus leviter strigulosis, tubi ore constricto intus parum puberulo extus striguloso sed basi glabro. *Stamina* medio tubo affixa; antheræ ovatæ in apiculos ad orem tubi corollini attingentes productæ. *Ovarium* glabrum; styli glabri parte superiore conica subtruncata vix bilobata inferiori æquilonga. *Nuculæ* 4 sæpe abortu 2 distinctæ scabridæ.

Socotra. A shrubby plant of the plains. B.C.S. n. 581.

Distrib. Endemic.

A species with a very distinctive foliage, inflorescence, and corolla, without any very near affinities in the genus.

4. TRICHODESMA.

Trichodesma, R. Br. Prod. 496; Benth. et Hook. Gen. Pl. ii. 845.

A small genus of about a dozen species of herbs, or rarely half shrubby plants, inhabiting warmer regions of Africa and Asia. One widely spread species extends to Australia. The three Socotran species are endemic.

1. T. Scotti, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 81. Tab. LV.

Fruticosum; foliis magnis ellipticis acutis basi angustatis sparsim setosis; floribus magnis in corymbos magnos terminales dispositis; nuculis magnis $\frac{2}{3}$ poll. longis anguste marginatis.

Frutex 4–5-pedalis ramulis validis striguloso-puberulis. *Folia* opposita petiolata magna $\frac{1}{2}$–$\frac{3}{4}$ ped. longa 3–5 poll. lata elliptica v. oblonga acuta basi attenuata margine undulata siccitate nigricantia subtus pallidiora setis ex tuberculis albidis orientibus sparsim vestita, proventu setis delapsis; petiolus 1–2 poll. longus. *Flores* magni evolventes in cymas bracteatas ad apicem rhachis basalis subcompressæ nonfloriferæ semipedalis confertas et paniculam corymbosam globosam terminalem formantes; pedicelli $1\frac{1}{4}$–$1\frac{1}{2}$ poll. longi validi hirti sæpe curvati; bracteæ magnæ foliis similes. *Calyx* alte 5-fidus, segmentis ovatis longe acutis basi rotundato-cordatis $\frac{1}{2}$ poll. longis basi $\frac{2}{3}$ poll. latis dense cano-sericeo-pubescentibus venulis a basi versus apicem incurvatis glanduloso-punctulatis, fructiferis non auctis. *Corolla* magna calyce longior sordido-alba basi fornicibus atris suffulta omnino glabra ad partem trientem lobata, lobis rotundatis cuspide longa terminatis. *Stamina* exserta in conum conniventes; antheræ lineares $\frac{2}{3}$ poll. longæ aristis glabris sinistorsum convolutis suffultæ dorsaliter lanatæ lateraliterque inter se pilis lanatis intricato-implectis conjunctæ. *Stylus* glaber corollæ æquilongus. *Nuculæ* multo complanatæ $\frac{2}{3}$ poll. longæ $\frac{1}{10}$ poll. crassæ ovatæ dorsaliter nitidæ venulosæ subpuberulæ margine in alam angustam denticulatam breviter introflexam productæ. *Testa* glabra crustacea.

Socotra. On the higher parts of the Haghier hills, at an elevation over 2500 feet. B.C.S. n. 438. Schweinf. n. 623.

Distrib. Endemic.

A species distinguished from all others by the large size of its leaves and flowers. A plant of Griffiths, from the Khasia hills, named *T. khasianum*, by C. B. Clarke (in Hook. Flor. Brit. Ind. iv. 154), approaches it in this respect, but is altogether smaller and is quite a distinct plant.

I have named the species after Scott, our collector, who first found the plant on Socotra.

2. **T. microcalyx**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 81.

Annuum hispido-asperum; foliis ellipticis v. ovatis, inferioribus petiolatis; floribus mediocris; calycis segmentis lanceolatis sub fructu non auctis; nuculis deltoideis dorsaliter valde muricatis non marginatis.

Herba annua 2–3-pedalis erecta aspera canescente-hispida pilis basi tuberculatis bipartim ramosa, caulibus quadrangulatis internodiis elongatis in inflorescentias deliquescentibus. *Folia* opposita, basalia $5\frac{1}{2}$ poll. longa 2 poll. lata elliptica acuta basi inæquilateralia subcuneata, margine obscure crenato-serrata, supra pilorum delapsorum baseis tuberculata subtus scabrida, petiolo 1 poll. longo, superiora gradatim minora sessilia ovato-acuta basi subcordata hispida. *Gemmæ* fulvo-hirsutæ. *Inflorescentia* primum dichasialis bracteis magnis foliaceis, ramulis penultimis $1\frac{1}{2}$–2 poll. longis basi nonfloriferis hirsutis apice sympodialiter ramosis bracteatis paucifloris, floribus pedicellatis extra-axillaribus plerumque cernuis, pedicellis hirtis $\frac{1}{4}$–$\frac{1}{2}$ poll. longis. *Flores* mediocri. *Calyx* alte 5-fidus, segmentis lanceolatis acutis $\frac{1}{3}$ poll. longis intus in parte superiore strigulosis extus dense hispidis medio nervo prominente, sub fructu non auctus. *Corolla* azurea $\frac{1}{2}$ poll. longa, tubo calyci æquilongo, lobis late rotundatis mucronulatis. *Stamina* exserta; antheræ anguste ovato-oblongæ $\frac{1}{8}$ poll. longæ aristis glabris æquilongæ dorsaliter in parte superiore villosæ et contiguæ pilis implectis conjunctæ, basi vix villosæ. *Nuculæ* calyce non opertæ deltoideæ $\frac{1}{6}$ poll. longæ glabræ dorso valde muricatæ non alatæ sed ad apicem margine paulum productæ.

Socotra. On the Haghier range near Adona. B.C.S. n. 538. Schweinf. n. 632. Nimmo.

Distrib. Endemic.

Another very distinct species of this genus. It differs from all described forms, especially in the calyx, which has narrow segments, and they do not enlarge in fruit, or become prolonged at the base. Thus the nucules are not completely hidden. In habit, it is a close ally of *T. africanum*, R. Br. (Prod. 496), a plant of wide distribution in tropical Africa, and south-west Asia. But our plant is more hispid, not so scabrous as the African plant, and then the calyx in that species has the segments enlarging, and becoming very cordate at the base in fruit, and the nucules are shortly marginate with hooked projections, and on the back is a median row of tubercles.

This is one of the Socotran plants in Kew Herbarium sent by Dr Nimmo.

3. **T. laxiflorum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 81.

Annuum sparsim setulosum; foliis ovatis v. oblongo-ovatis, inferioribus petiolatis; inflorescentiis laxe ramosis; floribus parvis; calycis segmentis lanceolatis sub fructu non auctis: nuculis obovatis dorsaliter minute tuberculatis margine alatis.

Herba annua 2–3-pedalis bipartim non copiose ramosa, caulibus teretibus erectis in inflorescentias ultime deliquescentibus pilis basi tuberculatis sparsim vestitis proventu setulis demissis plus minusve tuberculatis. *Folia* opposita, basalia petiolata 4 poll. longa 1½ poll. lata ovata v. oblongo-ovata acuta basi attenuata rarius rotundata margine obscure crenato-serrata ciliata submembranacea sparsim setulis brevibus ex tuberculis orientibus vestita, superiora sessilia basi subcordata minora cæteroquin basalibus similia. *Inflorescentiæ* primum laxe dichasiales bracteis lanceolatis foliaceis, ramulis penultimis 3½-4 poll. longis v. longioribus sympodialiter et subanfractuose ramosis paucifloris sparsim puberulis, floribus pedicellatis sæpius oppositibracteis, pedicellis capillaribus ¼–½ poll. longis strigulosis. *Flores* parvi. *Calyx* alte 5-fidus, segmentis ⅙ poll. longis lanceolatis acutis nervo medio inconspicuo dorsaliter hispidis intus versus apicem strigulosis, fructiferis non auctis. *Corolla* ¼ poll. longa calyce vix longior omnino glabra, lobis obovatis mucronulatis sæpe irregulariter dentatis. *Stamina* exserta; antheræ lineares ⅛ poll. longæ aristis glabris ⅙ poll. longis sinistrorsum contortis suffultæ dorsaliter puberulæ lateraliter longe pilosæ pilisque implectis inter se conjunctæ. *Nuculæ* ⅕ poll. longæ compressæ obovatæ glabræ dorso irregulariter tuberculatæ margine in alam magnam introflexam subvesiculosam vix dentatam productæ.

Socotra. Common. B.C.S. n. 532. Schweinf. nn. 293 in lit., 788.

DISTRIB. Endemic.

A third new species of the genus, not far removed from the last described, and like it an ally of *T. africanum*, R. Br. (Prod. 496). But it is a much smoother plant, and is further distinguished by its long lax inflorescences, small flowers with a calyx not enlarging around the fruit, the nucules of which have a very broad margin, folded in, bladder-like, over the back, which is irregularly tubercled.

5. CYSTISTEMON.

Cystistemon, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 82.

Calyx 5-partitus, segmentis linearibus, fructifer auctus nuculas includens. Corolla campanulata, supra staminum insertionem dilatata, fauce nuda ampliata; lobi 5, ovati, acuminati, imbricati, per anthesin patentes revoluti. Stamina 5, medium tubum versus affixa, exserta, filamentis obcordatis expansis inflatis basi annulo villoso cinctis; antheræ oblongo-lineares, longe acuminatæ, erectæ, conniventes, cohærentes. Ovarii lobi 4, distincti, gynobasi parvæ planæ impositi; stylus filiformis erectus, stigmate subintegro; ovula erecta. Nuculæ 4, erectæ, acutæ, angulatæ, verrucosæ, areola basalari. Semina recta; embryo rectus, cotyledonibus ovatis crassis plano-convexis, radicula supera.—Herba canescens, setoso-hispida pilis simplicibus. Folia alterna. Cymæ scorpioideæ terminales, bracteis parvis inferioribus foliaceis. Flores azurei, pedicellati.

A monotypic endemic genus founded chiefly on characters of the androecium. Each filament has an inflated sac attached to its back. One might take these at first for corolline scales, but they do not arise from the corolla nor are they attached to it in any way, but are distinct expansions of the filaments to which the anthers are dorsally affixed by a small area. The true anther lobes are very short, but have long apical appendages.

The fruit is that of *Lithospermeæ*, and in that tribe the affinities of the genus are with *Echium* and *Onosma*. But the former has a corolla of a different type, and the filaments are filiform, whilst the latter has a tubular corolla with obtuse anthers.

The form of the corolla and the general floral aspect bring it more satisfactorily into *Anchuseæ*, where its nearest ally seems to be *Borago*. With this genus I have not been able to unite it as there are no faucial corolline scales, and although the solid dorsal mucro of the filaments in *Borago* may be regarded as representing the dorsal vesicle of our genus, yet the anthers want the long appendages which are so prominent in our plant. There are in addition ovarian and fruit characters which distinguish the genera.

ETYM. κύστις, a bladder, and στήμων.

C. socotranus, Balf. fil. *loc. cit.* Tab. LVI.

1–2-pedalis canescens plus minusve hispidus setulis basi tuberculatis interque eos strigulosus a collo ramosus, caulibus angulatis, ramis in racemos cymarum scorpioidearum excurrentibus, cortice rumpente. *Folia* oblanceolata v. lanceolata acuta integra subtus pallidiora inferiora petiolata 4 poll. longa $\frac{3}{4}$ poll. lata basi gradatim attenuata, superiora minora sessilia basi cordata. *Cymæ* 2–4 poll. longæ villoso-hispidæ; pedicelli $\frac{1}{4}$ poll. longi. *Calyx* in segmenta $\frac{1}{3}$ poll. longa obtusa partita. *Corolla* $\frac{1}{2}$ poll. longa ad medium 5-fida, lobis venulosis margine obscure crenulatis extus puberulis. *Staminum* filamenta $\frac{1}{12}$ poll. longa glabra; antheræ $\frac{1}{12}$ poll. longæ minute tuberculatæ extus subtiliter puberulæ medio dorso affixæ, aristis $\frac{1}{3}$ poll. longis nervo medio conspicuo margineque subincrassato-denticulatis puberulis. *Discus* inconspicuus. *Nuculæ* dorsaliter convexæ ventraliter medio jugo prominulo apice deltoideæ $\frac{1}{8}$ poll. longæ glabræ.

Socotra. On the limestone cliffs at an elevation of over 1500 feet. Not uncommon. B.C.S. n. 309. Schweinf. n. 593.

The only species. A Borage-like plant with lovely azure blue flowers.

Order XLIX. CONVOLVULACEÆ.

A large order of plants of very various habit occurring in every part of the world, but most abundant in the tropics. Of the eight Socotran genera all have a wide distribution over the globe, save two; and of these, one is essentially American, but has a few cosmopolitan species, and the other is South Asiatic, reaching to Madagascar and Australia.

1. IPOMŒA.

Ipomœa, Linn. Gen. n. 216; Benth. et Hook. Gen. Pl. ii. 870.

A very large genus of, commonly twining, plants, found all over the world. Of the five Socotran species, two are widely spread over the globe, two are southern Asiatic and tropical African, and the fifth, belonging to the restricted section *Quamoclit*, is endemic.

1. I. **obscura**, Ker in Bot. Reg. t. 239; Choisy in DC. Prod. ix. 370. Ach. Rich. Tent. Flor. Abyss. ii. 69; Franch. Sert. Somal. in Miss. Révoil 41; Clarke in Hook. Flor. Brit. Ind. iv. 207.

I. ochracea, Don. Syst. iv. 270.
Convolvulus obscurus, Linn. Sp. 220.
C. gonatodes, Steud. in herb. Schimp. Abyss. sect. ii. n. 801.
C. ochraceus, Lindl. in Bot. Reg. t. 1060.

For the further extensive synonymy see authors quoted.

Nom. Vern. Irrham (B.C.S.).

Socotra. Not uncommon. B.C.S. n. 423. Schweinf. n. 451.

Distrib. Throughout India and the East, in regions bordering on the Indian Ocean, and in tropical Africa.

There appears to be no specific difference between the two plants figured in the *Botanical Register* as *Ipomœa obscura* and *Convolvulus ochraceus*. The hairiness of the one and the glabrousness of the other is not a persistent character,—we find amongst our Socotra specimens hairy and glabrous forms,—and the only point of difference between them is the colour of the corolla,—white or yellow,—white in *I. obscura*, and orange-yellow in *C. ochraceus*. Our Socotran plant has commonly orange flowers, and is therefore the *ochracea* form, which is perhaps only tropical African. Plants grown at Kew from seeds we sent from Socotra flowered in October, 1880.

2. I. **biloba**, Forsk. Fl. Ægypt. Arab. 44; Clarke in Hook. Brit. Ind. iv. 212.

I. maritima, R. Br. Prod. 486; Bot. Reg. t. 319.
I. Pes caprae, Roth Nov. Pl. Sp. 109; Choisy in DC. Prod. ix. 349; Franch. Sert. Somal. in Miss. Révoil 41.

Socotra. Common on the shores. B.C.S. n. 545. Schweinf. n. 786.

Distrib. On tropical shores, cosmopolitan.

3. I. (Quamoclit) **laciniata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 82.

Annua depressa radiatim ramosa ramis prostratis; foliis laciniatis pinnatisectis longe petiolatis sparsim pilosis; floribus subsessilibus in axillis solitariis; sepalis exterioribus subtrifidis; corolla angusta; ovario rostrato; seminibus maculosis pubescentibus.

Herba annua a collo radiatim ramosa, ramis prostratis sæpe longe patentibus 4 poll. longis sparsim pilosis. *Folia* ¾–1 poll. longa in ramis elongatis remota sed circum collum dense aggregata laciniatim et profunde pinnatisecta, segmentis linearibus terminali latiori et subcuneatim tridentato acutis sæpe lateraliter sectis fere 1 poll. longis, basi in petiolum canaliculatum plerumque lamina longiorem attenuata sparsim pilosa subtus scrobiculata. *Flores* in axillis solitarii brevissime pedicellati v. subsessiles; pedicelli sub flore bibracteolati; bracteolæ lineares pilosæ floribus breviores. *Sepala* inæqualia nonaculeata, tria exteriore majora ovata subtrifida lobo medio acuminato lobis lateralibus lanceolatis, parte basali submembranacea extus pilosa. *Corolla* angusta tubuloso-cylindrica v. infundibuli-

formis ⅓ poll. longa calyce multo longior. *Staminum* filamenta antheris vix longiora. *Ovarium* 4-ovulatum glabrum apice rostratum et in stylum 5-lobatum productum. *Capsulæ* glabræ globosæ 3–4-loculares in axillis foliorum basalium circum collum aggregatæ. *Semina* 3-4-maculata pubescentia.

Socotra. On the plains near Galonsir. B.C.S. n. 100.

Distrib. Endemic.

A pretty little species of the section *Quamoclit*. In habit and appearance it much resembles *Corchorus erodioides*, Balf. fil. (see page 39), and occurs with it on the plains. It has much smaller flowers and is altogether a more delicate species than any hitherto described.

4. I. (Pharbitis) **scabra**, Forsk. Fl. Ægypt. Arab. 44.

I. hederacea, Jacq. Collect. i. 124, and Ic. Rar. i. t. 36; Bot. Reg. t. 85; Clark in Hook. Flor. Brit. Ind. iv. 199.

I. cærulea, Kön; Bot. Reg. t. 276.

I. githaginea, Hochst. in herb. Schimp. Abyss. sect. ii. n. 784.

Convolvulus Nil, Linn. Sp. 219; Bot. Mag. t. 188.

Pharbitis hispida, Choisy in DC. Prod. ix. 341; Ach. Rich. Tent. Flor. Abyss. ii. 65.

P. Nil, Choisy *loc. cit.* 343.

P. hederacea, Choisy *loc. cit.* 344.

P. githaginea, Hochst. in. herb. Schimp. Abyss. sect. iii. n. 1446.

And many other synonyms.

Socotra. On the hills. Common. B.C.S. n. 546.

Distrib. Tropical and subtropical regions of the world.

5. I. (Aniseia) **cardiosepala**, Hochst. in herb. Kotsch. Nub. (1841), nn. 207, 384.

I. blepharosepala, Hochst. in herb. Schimp. Arab. n. 319; Ach. Rich. Tent. Flor. Abyss. ii. 72.?

I. calycina, Benth. et Hook. Gen. Pl. ii. 872; Clarke in Hook. Flor. Brit. Ind. iv. 201.

Convolvulus calycinus, Roxb. Flor. Ind. ed. Carey and Wall. ii. 51.

C. Hardwickii, Spreng. Syst. iv. 2, 60.

Aniseia calycina, Choisy in DC. Prod. ix. 429; Wight Ic. t. 833.

Socotra. Common. B.C.S. n. 57. Schweinf. n. 445.

Distrib. Indian Peninsula and north-west India, Nile Land and Senegal.

The flowers of the Socotran plants are either white or rose.

2. CONVOLVULUS.

Convolvulus, Linn. Gen. n. 215; Benth. et Hook. Gen. Pl. ii. 874.

A large genus spread all over the globe, but not so abundant in the tropics as the last. Of the four Socotran species, two are endemic, whilst the other two are restricted to the drier districts of south-west Asia, north Africa, and the Mediterranean region.

1. **C. filipes**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 82.

Suffruticosus inermis ramosissimus ramis scopariis filiformibus strigosis v. subsericeis; foliis linearibus strigosis; floribus longe pedicellatis laxos racemos terminales formantibus; calycis lobis corolla multo-brevioribus; ovario glabro; seminibus pubescentibus.

Suffrutex parvus a basi ramosus, ramis numerosissimis scopariis strigosis herbaceis divaricatim sæpeque fastigiatim ramosis, ramulis filiformibus ultimis sericeis subflexuosis. *Folia* linearia decidua, basalia $\frac{3}{4}$–$\frac{1}{2}$ poll. longa. strigosa, superiora remota minora, suprema filiformia sericea. *Flores* pedicellati in axillis superioribus solitarii et longos laxos racemos formantes; pedicelli capillares stricti 1 poll. longi v. minores supra medium articulati bibracteolati absque articulo sub anthesin anfractuosi. *Calycis* lobi subæquales ovato-acuti sericeo-strigosi $\frac{1}{12}$ poll. longi. *Corolla* alba calyce triplolongior angulis extus sericeo-strigosis. *Ovarium* glabrum; stylus inclusus. *Capsula* nitida glabra conoidea $\frac{1}{6}$ poll. diam. *Semina* pubescentia.

Socotra. Very common. B.C.S. 116. Schweinf. nn. 238, 382 in lit.

Distrib. Endemic.

One of the commonest plants on the island, occurring on all the plains, and one would hardly expect that it should be an endemic species; but I am unable to match it. Its nearest ally is *C. chondrilloides*, Boiss., a plant of south Persia; but the glabrous subaphyllous condition of this plant, its less scoparioid habit, the inflorescence and hirsute ovary, are sufficiently distinctive. Indeed, from all the species in Boissier's section *Inermes*, our plant is readily diagnosed by its glabrous ovary.

2. **C. sarmentosus**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 83.

Subpulvinatus inermis lignosus perennis argenteo-sericeus ramis brevibus basi congestis cum ramulis paucis virgatis sarmentosis; foliis basalibus rosulatis oblanceolatis, superioribus ovato-acutis v lanceolatis; floribus pedicellatis breves racemos simplices formantibus; ovario glabro; seminibus puberulis.

Suffrutex lignosus humilis prostratus subpulvinatus argenteo-sericeus a collo ramosus, ramorum baseis brevibus congestis perennibus depressis, ramulis superioribus in virgas annuas sarmentosas apice adscendentes elongatis. *Folia* ad apices ramorum inferiorum rosulata oblanceolata v. anguste obovata obtusa v. late acuta 1 poll. longa $\frac{1}{4}$ poll. lata in petiolum gradatim attenuata, in ramis pulvinatis folia omnino minora, superiora in ramis elongatis remota subsessilia oblongo-acuta v. lanceolata longitudine latitudineque variantia. *Flores* solitarii in axillis superioribus et laxos simplices racemos formantes pedicellati; pedicelli stricti adscendentes demum in parte superiore subcernui $\frac{1}{3}$–$\frac{3}{4}$ poll. longi bracteis longiores supra medium articulati bibracteolati. *Calycis* lobi subæquales ovati acuti $\frac{1}{12}$ poll. longi sericei. *Corolla* $\frac{1}{4}$–$\frac{1}{3}$ poll. longa alba extus quinque lineis sericeis notata. *Ovarium* glabrum; stylus ad medium bifidus inclusus. *Capsula* glabra globosa $\frac{1}{8}$ poll. diam. *Semina* subtiliter puberula.

Socotra. On the limestone plateau overlooking Galonsir valley on the west, at an elevation over 1500 feet. B.C.S. nn, 131?, 302.

Distrib. Endemic.

A pretty white-flowered species, a very characteristic plant of the dry limestone plains. We only found it at one locality. Its position in the genus is in

Boissier's section *Pannosi*, of the eastern forms, in which are a set of species almost entirely denizens of the dry regions of south-west Asia. With no described form, however, is it conspecific.

The specimen n. 131, a fragmentary one, is, with doubt, referred to this species.

3. C. glomeratus, Choisy in DC. Prod. ix. 401; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 24; Boiss. Flor. Orient. iv. 102; Clarke in Hook. Flor Brit. Ind. iv. 219; Wight Ic. t. 1366.

I. auricoma, Ach. Rich. Tent. Flor. Abyss. ii. 67.?

Socotra. Common on the plains and hill slopes. B.C.S. n. 115 Schweinf. n. 387.

DISTRIB. India, south-west Asia and north-west tropical Africa, a plant varying much, both in size of leaf and in size of head. The larger heads on our specimens are associated with a distinctly twining habit of stem.

4. C. siculus, Linn. Sp. 223; Choisy in DC. Prod. ix. 407; Ach. Rich. Tent. Flor. Abyss. ii. 73; Boiss. Flor. Orient. iv. 109; Sibth. Flor. Graec. t. 196; Bot. Reg. t. 445.

Socotra. Near Galonsir. B.C.S. n. 165.

DISTRIB. Canary Islands and Mediterranean region into Syria.

3. EVOLVULUS.

Evolvulus, Linn. Gen. n. 385; Benth. et Hook. Gen. Pl. ii. 875.

A considerable genus, almost entirely American; but a few species spread into the old world.

E. alsinoides, Linn. Sp. 392; Choisy in DC. Prod. ix. 447; Boiss. Flor. Orient. iv. 113; Clarke in Hook. Flor. Brit. Ind. iv. 220.

E. linifolius, Linn. *loc. cit.*; Choisy *loc. cit.* 449; Ach. Rich. Tent. Flor. Abyss. ii. 75; Lamk. Illustr. ii. 351, t. 216, f. 1.

E. fugacissimus, Hochst. in herb. Schimp. Abyss. sect. ii. n. 828; Ach. Rich. *loc. cit.*

E. hirsutus, Lamk. Encyc. iii. 538, and Illustr. ii. 351, t. 216, f. 2.

Socotra. Common. B.C.S. n. 271. Schweinf. nn. 418 in lit., 496.

DISTRIB. Cosmopolitan in tropical and subtropical regions.

Both the extremely hairy and the more glabrous forms of this species occur on the island, as well as the narrow-leaved and broader-leaved types.

4. PORANA.

Porana, Burm. Flor. Ind. 51, t. 21*, f. 1; Benth. et Hook. Gen. Pl. ii. 876.

A small genus of seven species of climbing or twining plants distributed in India and the Malay Archipelago. One species is found in Madagascar, and one in Australia.

P. obtusa, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 83. Tab. LVII.

Fruticosa scandens; foliis oblongo-obtusis; sepalis sub fructu paulum auctis; corollæ lobis induplicato-valvatis; stylis duobus.

Frutex late scandens subtiliter pubescens. *Folia* petiolata alterna oblonga obtusa sæpe apiculata basi subinæquilateralia 2½–3 poll. longa ¾–1 poll. lata margine subundulata coriacea, oblique pennivenia supra glabrescentia subtus venulosa puberula; petiolo ½–⅔ poll. longo. *Cymæ* racemoso-paniculatæ axillares 3–4 poll. longæ, ramis primariis ½ poll. longis strictis, pedicellis ⅙–¼ poll. longis omnibus pubescentibus; bracteolæ minutissimæ. *Sepala* obovata obtusa subæqualia extus pubescentia subæqualia persistentia ⅕ poll. longa fructifera parum aucta subpatentia $\frac{3}{10}$ poll. longa vix membranacea venulosa. *Corolla* campanulata ad medium 5-fida calyce brevior, lobis induplicato-valvatis extus villosis et glanduloso-punctulatis. *Stamina* fere ad basin tubi corollini late affixa inclusa, filamentis basi dilatatis glabris antheris oblongis sublongioribus. *Discus* annularis. *Ovarium* 2-loculare 4-ovulatum; styli 2 æquales a basi soluti filiformes, stigmatibus capitatis. *Fructus* pyriformis v. ovoideus parvus glaber indehiscens ⅕ poll. longus niger, pericarpio glanduloso punctulato tenui coriaceo. *Semina* abortu 1 rarius 2 erecta late inserta glabra ovoidea, testa mucosa; albumen abundans mucosum; embryo replicatus cotyledonibus arcte 2-lobis, radicula infera.

Socotra. At the west end of Kadhab plain. B.C.S. n. 355.

Distrib. Endemic.

A somewhat remarkable climber referred provisionally to this genus. At one time I was inclined to take it as the type of a new genus. But it has so many points of resemblance with species relegated to the polymorphous genus *Porana*, that for the present I have placed it here.

There are, however, several noteworthy points of divergence from the generic character. In the calyx, which is very small in the flower, but in fruit enlarges enormously, is found one of the chief characteristics of *Porana*. But in our plants the sepals are large, and somewhat membranous in the flower, and only increase to a small extent in fruit, never becoming so thoroughly scarious as in typical *Poranæ*. Again, in our plant we find two distinct styles, whereas in *Porana*, although the style is often deeply cleft, the division never extends to the very base. In *Breweria* as much variation exists, so that this is a character upon which much stress need not be laid. Further, in the corolla we find the æstivation of our plant is induplicato-valvate, in *Porana* it is plicate. Our plant is of a more robust habit than most *Poranæ*, and has obtuse, not pointed leaves, nor are these cordate at the base. Although our plant presents these differences, in the majority of technical characters it agrees well with the genus, and I consider it more judicious to regard *Porana* as an incompletely defined genus including our plant, than to create a new one for it.

With the monotypic and little known Madagascar genus *Bonamia*, the Socotran plant shows many points of resemblance, but the hairy bases of the stamens, and the absence of albumen in that genus exclude our plant.

5. BREWERIA.

Breweria, R. Br. Prod. 487; Benth. et Hook. Gen. Pl. ii. 876.

A genus of about twenty-four species varying greatly in habit, distributed over the warmer parts of both the old and new worlds. Three of the Socotran species are endemic, and the fourth is essentially a plant of the desert plains of north-west Africa, and south-west Asia.

1. B. (Seddera) **latifolia**, Benth. et Hook. Gen. Pl. ii. 877.

Seddera latifolia, Hochst. in Flora 1844, Beil. 7, t. 5, ff. B, C.; Choisy in DC. Prod. ix. 440; Boiss. Flor. Orient. iv. 114.

Cressa latifolia, T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 25 (syn. plur. excl.).

Socotra. On the plains. Not uncommon. B.C.S. nn. 17, 727. Schweinf. n. 352.

Distrib. Abyssinia, south-west Asia.

A characteristic desert plant presenting a very various appearance according to its locality of growth. Frequently a hard dwarf undershrub with small leaves, in other places developing long twigs with larger leaves.

It is quite a distinct plant from *B. evolvuloides*, Choisy (Convolv. Or. 112, and in DC. Prod. ix. 439), with which T. Anderson considered it conspecific.

2. B. (Seddera) **pedunculata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 83.

Suffruticosa virgata incana pubescente-tomentosa; foliis oblongis subsessilibus; floribus valide pedunculatis in axillis solitariis; calyce corolla breviore; ovario hirto; stylis 2.

Suffrutex virgatus incanus pubescente-tomentosus a basi ramosus ramis strictis divaricatis. *Folia* remota pauca subsessilia oblonga obtusa v. apiculata $\frac{1}{4}$–$\frac{1}{3}$ poll. longa $\frac{1}{6}$ poll. lata, superiora multo minora, dense pubescentia. *Flores* pedunculati in axillis foliorum superiorum solitarii et racemos longos laxos formantes; pedunculi breves validi adscendentes bracteis longiores ad medium v. supra articulati bracteolisque 2 minutis suffulti. *Sepala* subæqualia $\frac{1}{8}$ poll. longa ovata subacuta extus pubescentia post anthesin patentia. *Corolla* in superiore dimidio exserta extus pilosa. *Staminum* filamenta tenuia. *Ovarium* hirtum; styli 2 corolla breviores, stigmatibus capitatis. *Capsula* $\frac{1}{6}$ poll. diam. supra pilosa calyce $\frac{1}{3}$ longior. *Semina* glabra minute punctulata.

Socotra. On the plains. B.C.S. n. 158.

Distrib. Endemic.

A form with some resemblance to the foregoing species, but very Convolvuloid in aspect. Its two styles with capitate stigmas technically exclude it from *Convolvulus*, and its four ovules shut it out of *Evolvulus*. In *Breweria* it falls into the section *Seddera*, and is readily distinguished in the section by its stout floral pedicels and its virgate habit.

3. B. (Seddera) **glomerata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 83.

Suffruticosa nana prostrata lignosa albido-tomentosa ramis congestis; foliis ovatis v. ellipticis subsessilibus; floribus in capitula hirta terminalia confertis; calyce corolla longiore; ovario hirto; stylis 2.

Suffrutex nanus lignosus prostratus subpulvinatus molliter albido-tomentosus, ramis validis brevibus congestis v. interdum ultimis elongatis. *Folia* subsessilia v. breviter petiolata sæpe ad extremitates ramulorum lateralium contractorum rosulata ovata v. elliptica obtusa v. acuta $\frac{1}{2}$–$\frac{2}{3}$ poll. longa $\frac{1}{4}$ poll. lata mollia incana venulis subtus parum prominulis. *Flores* in capitula terminalia globosa multiflora hirta noninvolucrata $\frac{1}{2}$ poll. diam. aggregati flore quoque bracteolo setuloso hirtello subtento. *Sepala* oblanceolata v. obovata acuminata $\frac{1}{4}$ poll. longa extus hirta. *Corolla* angusta infundibularis inclusa extus hirtella. *Stamina* inclusa filamentis subtilibus. *Ovarium* adpresse hirsutum; styli 2 exserti apice capitati. *Capsulam* maturam non vidi.

Socotra. On the plains. Not common. B.C.S. n. 114. Schweinf. n. 258.

DISTRIB. Endemic.

Another Convolvuloid species of this genus, closely resembling such Arabian forms as *Convolvulus compactus* Boiss. (Diagn. ser. i. 4. 40, and Flor. Orient. iv. 98) and its allies. But as in the case of the foregoing species the capitate stigmas technically exclude it from *Convolvulus*, and its ovary equally separates it from *Evolvulus*. It is quite a distinct species in this genus, and a very typical desert form.

4. **B.** (Seddera) **fastigiata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 83. Tab. LVIII.

Suffruticosa argenteo-sericea fastigiatim denseque ramosa ramis strictis; foliis approximatis subimbricatis lanceolatis sessilibus; floribus sparsis in axillis subsessilibus; sepalis apice conniventibus corolla brevioribus; ovario glabro; stylo breviter bilobato.

Suffrutex 4-pedalis argenteo-sericeus lignosus dense fastigiatim ramosus ramis ultimis strictis rigidis brevibus post folia delapsa persistentibus marcidis siccitateque subspinosis. *Folia* minuta approximata cauli appressa et subimbricata sessilia lanceolata acuta $\frac{1}{6}$ poll. longa $\frac{1}{24}$ poll. lata argenteo-sericea. *Flores* sparsi subsessiles in axillis foliorum solitarii. *Calyx* tubulosus subovoideus ore constricto, segmentis $\frac{1}{6}$ poll. longis oblongis subacuminatis subcrustaceis extus sericeo-strigosis, interioribus latioribus margine membranaceis. *Corolla* alba parva infundibularis $\frac{1}{4}$ poll. longa extus in parte exserta hirtella. *Stamina* inclusa. *Discus* cupuliformis subtiliter crenulatus. *Ovarium* glabrum 4-ovulatum; stylus vix exsertus bilobatus lobis brevibus obovoideis. *Capsula* omnino calyce inclusa $\frac{1}{8}$ poll. longa.

NOM. VERN. Sāhdek (B.C.S.).

Socotra. Common on the plains. B.C.S. nn. 73, 273. Schweinf. n. 249.

DISTRIB. Endemic.

One of the commonest plants on Galonsir plain and on other plains of the island, its dwarf, half shrubby dendriform habit giving a peculiar feature to the plains. There can be little doubt a plant so abundant on the island occurs on the adjacent continents, but as yet we only know it as endemic in Socotra.

Is it rightly referred to this genus? Its habit is thoroughly Breweriod,

but at the same time its calyx and the style are quite different from those of other species in the *Seddera* section of the genus, or indeed, in the whole genus. With *Cressa* its flowers have some resemblance, but the solitary bilobate style is diagnostic. By certain of its technical characters, especially of the style, it might fall into *Ipomœa*—but the habit is against such an identification.

All that I can say for its position here is, that it is the most natural one I can find for the plant, which may be considered as one of those forms which break down the somewhat artificial distinctions upon which several of the genera in this order are, for convenience, based.

6. DICHONDRA.

Dichondra, Forst. Char. Gen. 39, t. 20; Benth. et Hook. Gen. Pl. ii. 879.

A genus of some five species of creeping herbs, spread through the warmer parts of the globe.

D. repens, Forst. Char. Gen. 39, t. 20; Choisy in DC. Prod. ix. 451; Lamk. Illustr. ii. 328, t. 183.

Socotra. Not uncommon. B.C.S. n. 612. Schweinf. n. 613.

Distrib. Tropics and sub-tropics of both hemispheres.

Extending northwards to China in the old world, and though found at the Cape, in the Mascarene and Canary Islands, is not reported from tropical Africa, nor is it found in India.

7. CRESSA.

Cressa, Linn. Gen. n. 313; Benth. et Hook. Gen. Pl. ii. 881.

Includes a single species which occurs in sandy shore districts of all warmer regions of the globe.

C. cretica, Linn. Sp. 325; Choisy in DC. Prod. iv. 440; Ach. Rich. Tent. Flor. Abyss. ii. 75; Boiss. Flor. Orient. iv. 114; Clarke in Hook. Flor. Brit. Ind. iv. 225; Sibth. Flor. Græc. t. 256; Lamk. Illustr. ii. 328, t. 183.

Socotra. On the sandy plains. Common. B.C.S. n. 539.

Distrib. Of the genus.

8. CUSCUTA.

Cuscuta, Linn. Gen. n. 170; Benth. et Hook. Gen. Pl. ii. 881.

A considerable genus of warm and temperate regions of the whole globe. Both Socotran species are widely dispersed old world forms.

1. C. planiflora, Tenore Syll. 128, and Flor. Neap. t. 220, f. 3; Engelm. Cusc. in Trans. Acad. Sc. St. Louis i. (1859), 464; Boiss. Flor. Orient. iv. 116 Clarke in Hook. Flor. Brit. Ind. iv. 227.

C. minor, Choisy in DC. Prod. ix. 453.

C. brevistyla, Braun in herb. Schimp. Abyss. sect. iii. n. 1486, ex Ach. Rich. Tent. Flor. Abyss. ii. 79; Engelm. Cusc. *loc. cit.* 467.

C. palæstina, Boiss. Diagn. ser. i. 11. 86, and Flor. Orient. iv. 116; Engelm. Cusc. *loc. cit.* 467.

And many other synonyms, for which see authors quoted.

var. **globulosa**, Balf. fil.

Saepius rubella caulibus tenuissime capillaribus; floribus minutis sessilibus capitula minima 2–3-flora glabra basi bracteata formantibus; calyce purpureo breviter obconico; corollæ lobis supra capsulam conniventibus.

C. globulosa, Boiss. et Reut. Diagn. ii. 3, 126; Boiss. Flor. Orient. iv. 117.

Socotra. Common. Parasitic on *Vernonia cinerascens*, Sch. Bip., *Indigofera intricata*, Boiss., and *Dicliptera effusa*, Balf. fil. B.C.S. n. 113.

Distrib. Of the species—from the Canary Islands through north Africa, and south Europe to south-west and Central Asia. Of the variety—from Syria eastwards to southern Persia.

A very variable and widely dispersed species, the forms of which have been ranked by various authors as species, and hence the synonymy is very extensive.

Our Socotran plant is the form found from Syria eastwards to south Persia, and described by Boissier (*loc. cit.*) as *C. globulosa*. Its characteristics are, marked purpling both of stems and calyx, exceeding delicate habit with very minute flowers aggregated in few-flowered heads, usually only two or three in each, and the corolla-lobes connivent in fruit over the capsule.

While I regard this as one of the forms of the above widely dispersed species, it is so distinct as to merit recognition as a variety for which Boissier's specific name may be retained.

2. **C. chinensis**, Lamk. Encyc. ii. 229; Choisy in DC. Prod. ix. 457; Engelm. Cusc. in Trans. Acad. Sc. St. Louis i. (1859), 479; Boiss. Flor. Orient. iv. 120; Clarke in Hook. Flor. Brit. Ind. iv. 226; Wight Ic. t. 1373.

Nom. Vern. Kzích (Schweinf.).

Socotra. Common on many plants, such as, *Ochradenus baccatus*, Del. *Convolvulus siculus*, L., *Dicliptera effusa*, Balf. fil., *Abutilon fruticosum*, Guill. et Perr., *Forskohlia viridis*, Ehrenb., species of *Boerhaavia*, *Commelina*, *Hypoestes*, &c. B.C.S. n. 108. Schweinf. n. 364.

Distrib. From Syria eastwards, through south Asia to China. Also in Australia. Apparently not African.

Order L. SOLANACEÆ.

A vast order of herbs, shrubs, or soft-wooded trees in tropical and warmer regions of the globe. Especially abundant in America. Some species reach more temperate zones in both hemispheres. Of the five Socotran genera all

are widely dispersed over the world, save one which is restricted to south Europe, Africa, and southern Asia.

1. SOLANUM.

Solanum, Linn. Gen. n. 251 ; Benth. et Hook. Gen. Pl. ii. 888.

A huge cosmopolitan genus attaining its maximum of development in America. Of the Socotran species one is cosmopolitan, one is widely spread in tropics of the old world, the third is a south-west Asiatic species.

1. S. nigrum, L. Sp. 266; Dunal in DC. Prod. xiii. 1, 50; Ach. Rich. Tent. Flor. Abyss. ii. 99; Boiss. Flor. Orient. iv. 284; Clarke in Hook. Flor. Brit. Ind. iv. 229; Syme Eng. Bot. tt. 931, 932.

For the very extensive synonymy, see the authors quoted.

Socotra. Common near villages. B.C.S. n. 9. Schweinf. n. 401.

Distrib. Cosmopolitan.

2. S. indicum, Nees ab Esenb., in Trans. Linn. Soc. xvii. (1837), 55; Dunal in DC. Prod. xiii. i. 309; Clarke in Hook. Flor. Brit. Ind. iv. 234; Wight Ic. t. 346.

Nom. Vern. Harchēm (Schweinf.).

Socotra. Common near villages. B.C.S. n. 68. Schweinf. n. 325. Hunter 5.

Distrib. Tropics of the old world.

3. S. gracilipes, Dcne. in Jacquem. Voy. Ind. 113, t. 119; Dunal in DC. Prod. xiii. i. 286; Boiss. Flor. Orient. iv. 286; Clarke in Hook. Flor. Brit. Ind. iv. 237.

Nom. Vern. Mrchéa (Schweinf.).

Socotra. At the foot of the limestone hills, west from Tamarida. Schweinf. n. 366.

Distrib. Beloochistan and north-west India. Arabia ?

Schweinfurth sends a couple of fragments of this species, which we did not obtain. It is not improbable that this is the *S. cordatum,* Forsk. (Fl. Ægypt. Arab. 47), but in the absence of specimens of the latter, it is not possible to decide.

2. PHYSALIS.

Physalis, Linn. Gen. n. 250; Benth. et Hook. Gen. Pl. ii. 890.

A genus of thirty species of herbs or small undershrubs, chiefly American, but dispersed all over the world.

P. minima, Linn. Sp. 263; Nees ab Esenb. in Trans. Linn. Soc. xvii. (1837), 69; Dunal in DC. Prod. xiii. 1. 445; Clarke in Hook. Flor. Brit. Ind. iv. 238.

Socotra. Near Tamarida. Schweinf. n. 317.

Distrib. Common in the tropics of the old world.

3. WITHANIA.

Withania, Pauq. Diss. de Bellad. Paris, 1824, ex End. Gen. 666; Benth. et Hook.Gen. Pl. ii. 893.

A small genus of some half-dozen species of woody shrubs or undershrubs ranging through south Europe and south Asia, and through north Africa to the Canary Islands. Also found at the Cape. Of the Socotran species, one has the distribution of the genus, the other is endemic.

1. W. somnifera, Dunal in DC. Prod. xiii. 1. 453; Boiss. Flor. Orient. iv. 287; Clarke in Hook. Flor. Brit. Ind. iv. 239.

Physalis somnifera, Linn. Sp. 261; Nees ab Esenb. in Trans. Linn. Soc. xvii. (1837), 66; Wight Ic. t. 853; Sibth. Flor. Graec. t. 233.

Socotra. Near Tamarida. Schweinf. n. 341. Hunter.

Distrib. Of the genus.

Schweinfurth sends this, which he found growing along with the next species. We did not obtain it, and I fancy it is not so abundant as the next.

2. W. Riebeckii, Schweinf. in Proc. Roy. Soc. Edin. xii. (1883), 83. Tab. LIX.

Frutex parvus habitu foliisque *W. somniferæ* sed ab ea differens calyce profunde diviso et fructifero non vesicoso oreque subaperto.

Suffrutex erectus 8-pedalis plus minusve tomentosus pilis stellatis canus ramis rectis sæpe subanfractuosis. *Folia* ovata v. elliptico-oblonga v. obovata obtusa 2–3½ poll. longa 1–1½ poll. lata sæpe multo majora basi inæqualia et in petiolum plerumque attenuata integra nonnunquam margine undulata. *Flores* ☿ in axillis 4–6 conferti breviter pedicellati; pedicelli ½ poll. longi fructiferi subcernui. *Calyx* campanulatus arcte 5-fidus laciniis lanceolatis fructifer ½ poll. longus auctus non inflatus sed apertus. *Corolla* subrotata. *Stylus* filiformis apice bilobatus. *Bacca* globosa rubra vix pisi magnitudine. *Semina* tuberculata.

Nom. Vern. Ôbap (B.C.S.). Ābab (Schweinf.).

Socotra. On the plains near villages. B.C.S. n. 32. Schweinf. nn. 326, 794.

Distrib. Endemic.

A species, which in habit and foliage, closely resembles the foregoing widely spread form, but as Schweinfurth clearly recognised, presents characters which are very distinctive. These lie in the calyx.

In true *W. somnifera*, the calyx in fruit has quite a Physaloid character, the narrow short calycine segments forming a crown of subciliate appendages at the apex, and the berry is quite concealed in the vesicose covering. But in this Socotran species the calyx is in the first instance much more deeply divided, almost two-thirds of the way down, and then in fruit, whilst it enlarges to a certain extent, it never forms a nearly closed sac around the berry. The

differences in appearance are very pronounced, and, notwithstanding their great likeness in habit and foliage, there is no difficulty in separating the species.

I have searched through the specimens of *W. somnifera*, in Kew Herbarium, but have not been able to find on any of them an approach to the calycine condition of this new Socotran species. All plants even from the adjacent shores of Arabia and Africa are typical *W. somnifera*. This is the only species in our collection, but Schweinfurth found it growing along with the true *W. somnifera*.

The vernacular name Ābab or Ōbap is, according to Schweinfurth, the same as that given by the Arabs on the opposite Arabian coast to *W. somnifera*. His specimens from Schugra, he tickets, 'Abúbb.'

4. LYCIUM.

Lycium, Linn. Gen. n. 262; Benth. et Hook. Gen. Pl. ii. 900.

A moderate genus of usually spiny shrubs or small trees, inhabiting temperate and subtropical regions of the whole world, but most abundant in south America, and south Africa.

L. europæum, Linn. Mant. 47; T. Anders. in Ann. Nat. Hist. ser. 2, xx. 126, and in Journ. Linn. Soc. v. (1860), Suppl. 26; Clarke in Hook. Flor. Brit. Ind. iv. 240; Sibth. Flor. Graec. t. 236.

L. arabicum, Schweinf. in herb.; Boiss. Flor. Orient. iv. 289.
L. mediterraneum, Dunal in DC. Prod. xiii. 1. 523.

There are many other synonyms, for which see authorities quoted.

Socotra. Common about Galonsir and elsewhere. B.C.S. n. 95. Schweinf. n. 728.

Distrib. Mediterranean region and south-west Asia, India.

5. DATURA.

Datura, Linn. Gen. n. 246; Benth. et Hook. Gen. Pl. ii. 901.

A small genus of a dozen species, widely dispersed over the globe.

D. fastuosa, Linn. Sp. 256; Dunal in DC. Prod. xiii. 1. 542; Clarke in Hook. Flor. Brit. Ind. iv. 242; Wight Ic. t. 1396,

var. **alba**, Clarke *loc. cit.* 243.

D. alba, Nees ab Esenb. in Trans. Linn. Soc. xvii. (1837), 73; Dunal in DC. Prod. xiii. i. 541; Wight Ic. t. 852.

Socotra. Common near villages. B.C.S. n. 218. Schweinf. n. 316.

Distrib. Cosmopolitan weed.

Order LI. SCROPHULARINEÆ.

A large order widely dispersed over all parts of the world. Twelve genera are represented in Socotra, of which one is endemic, two are entirely African, one of them reaching to the Cape, and four of the others are essentially north-west African and south-west Asiatic species, though one extends to the Cape de Verde Islands. The remainder have a wider range,—either in the old world alone, or in both old and new worlds.

1. ANTICHARIS.

Anticharis, Endl. Gen. 682, and Iconogr. t. 93; Benth. et Hook. Gen. Pl. ii. 928.

A small genus of four species of viscid herbs entirely confined to north-west tropical Africa and the plains of south-west Asia.

A. arabica, Endl. Nov. Stirp. Decad. 23, and Iconogr. t. 93; Benth. in DC. Prod. x. 347; Aschs. in Monatsb. k. Akad. Wiss. Ber. 1866, 881; Boiss. Flor. Orient. iv. 422; Franch. Sert. Somal. in Miss. Révoil 54.

Meisarrhena tomentosa, R. Br. in Salt Abyss. app.
Capraria arabica, Hochst. et Steud. in herb. Schimp. Arab. n. 748.

Socotra. On the sandy plains. B.C.S. n. 537.

DISTRIB. Arabia, Beloochistan, Nile Land.

Very nearly allied to the other Arabian and tropical African species, *A. glandulosa*, Aschs. (in Monatsb. k. Akad. Wiss. Berol. 1866, 880), and *A. linearis*, Hochst. (Aschs. *loc. cit.*), with which it has been often confused. The *A. arabica* of Ach. Richard (Tent. Flor. Abyss. ii. 119) is *A. linearis*, Hochst, and the Aden plant, referred by T. Anderson (in Journ. Linn. Soc. v. (1860), Suppl. 27) to *A. arabica*, is *A. glandulosa*, Aschs.

2. LINARIA.

Linaria, Juss. Gen. Pl. 120; Benth. et Hook. Gen. Pl. ii. 932.

A large genus of herbs inhabiting extratropical regions in the northern hemisphere of the old world, but a few are tropical species. One only occurs in extratropical America.

L. (Elatinoides) **hastata**, R. Br. in Salt Abyss. app.; Benth. in DC. Prod. x. 269; Ach. Rich. Tent. Flor. Abyss. ii. 113.

L. capillipes, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1042.

Socotra. On the plains. Not uncommon. B.C.S. nn. 21, 718. Schweinf. n. 311.

DISTRIB. Abyssinia.

The leaves on the Socotran specimens do not show the hastation so clearly as those of the type, and they are more generally linear. The radical leaves in some specimens are somewhat pilose.

3. SCHWEINFURTHIA.

Schweinfurthia, A. Braun in Monatsb. Akad. Wiss. Berol. 1866, 872, c. ic.; Benth. et Hook. Gen. Pl. ii. 933.

A small genus of three species of Linarioid herbs. One occurs in Arabia and in Nile Land, another is found in Persia and Scindh, and the third is the Socotran plant, which is found elsewhere only at Aden.

S. pedicellata, Benth. et Hook. Gen. Pl. ii. 934.

Anarrhinum pedicellatum, T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 26.

Socotra. On the plains. B.C.S. n. 540.

DISTRIB. Aden.

The Socotran plant has a much stouter habit than that from Aden.

4. ANTIRRHINUM.

Antirrhinum, Linn. Gen. n. 750; Benth. et Hook. Gen. Pl. ii. 934.

A small genus of about twenty-five herbaceous species, inhabiting temperate and subtropical regions of both hemispheres.

A. Orontium, Linn. Sp. 860; Benth. in DC. Prod. x. 290; Ach. Rich. Tent. Flor. Abyss. ii. 114; Boiss. Flor. Orient. iv. 385; Hook. in Flor. Brit. Ind. iv. 253; Syme Eng. Bot. t. 954.

Socotra. On Kadhab plain. B.C.S. n. 350.

DISTRIB. Europe, and from the Azores and Canary Islands eastwards through the Mediterranean region, Abyssinia, and Persia to Afghan and northern India.

Our plants are distinctly pilose at the base.

5. SCROPHULARIA.

Scrophularia, Linn. Gen. n. 756; Benth. et Hook. Gen. Pl. ii. 937.

A large genus widely spread in the northern hemisphere, its maximum being reached in the Mediterranean region, and south-west Asia. Few are American.

S. arguta, Ait. Hort. Kew. ed. 1, ii. 342; Benth. in DC. Prod. x. 305; Boiss. Flor. Orient. iv. 395; Webb Flor. Canar. Ic. t. 177.

S. rostrata, Hochst. in herb. Schimp. Abyss. sect. iii. n. 1428.

Socotra. On the hill slopes. B.C.S. n. 604. Schweinf. 537.

DISTRIB. From Canary Islands through north Africa, Syria, Abyssinia, and Somali Land to Persia.

Very common on the hill slopes, growing with such other annuals as *Campanula dichotoma, Erythræa Centaurium,* &c.

6. LINDENBERGIA.

Lindenbergia, Lehm. in Link et Otto, Ic. Pl. Rar. i. 95, t. 48; Benth. et Hook. Gen. Pl. ii. 948.

A small genus of nine species of herbs, usually hairy, distributed in southern Asia and east tropical Africa.

L. sinaica, Benth. Scroph. Ind. 22, and in DC. Prod. x. 377; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 27; Boiss. Flor. Orient. iv. 425.

Bovea sinaica, Dene. in Ann. Sc. Nat. sér. 2, ii. (1834), 253.

Socotra. On the plains. B.C.S. nn. 70, 530. Schweinf. n. 332.

DISTRIB. From Nubia and Egypt, along the shores of the Red Sea to Arabia and Persia.

As it occurs on Socotra this plant is liable to some variation. In some localities it forms a hard-wooded herb with stiff erect branches, in others it has a delicate trailing habit. The leaves, too, vary in size. Some of the woody specimens present only sessile or subsessile, very minute leaves, and in such forms the flowers are usually small, with corollas only twice as long as the calyx. In the delicate spreading specimens the leaves have long stalks and the flowers are large, the corolla usually three times, or more, the length of the calyx.

The woody somewhat shrubby specimens appear so very different from the other forms, which more nearly resemble the type, that one might expect they would constitute a distinct species. But I can draw up no sufficient diagnosis between the forms, and indeed amongst continental specimens, I find nearly as much variation.

7. HERPESTIS.

Herpestis, Gärtn. fil. Fruct. iii. 186, t. 214; Benth. et Hook. Gen. Pl. ii. 951.

A genus of about fifty species of herbs, found in the warmer regions of both hemispheres. Especially abundant in America.

H. Monnieria, H. B. K. Nov. Gen. et Sp. ii. 366; Benth. in DC. Prod. x. 400; Boiss. Flor. Orient. iv. 426; Bot. Mag. t. 2557.

Socotra. Common in marshy places. B.C.S. n. 34. Schweinf. nn. 273, 701 in lit.

DISTRIB. Cosmopolitan in the tropics.

8. CAMPTOLOMA.

Camptoloma, Benth. in DC. Prod. x. 430; Benth. et Hook. Gen. Pl. ii. 960.

A genus hitherto monotypic; the species, *C. rotundifolia*, Benth., growing in the western region of south tropical Africa, at Elephant's Bay.

C. villosa, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 84. Tab. LX.

Herba perennis villosa; foliis rotundato-cordatis crenulato-dentatis; floribus paucis in racemos terminales breves dispositis; capsula calycem excedente.

Herba a basi ramosa pedalis omnino dense villosa ramis in inflorescentiam excurrentibus. *Folia* longe petiolata rotundato-cordata v. suborbicularia $\frac{3}{4}$–1 poll. diam. basalia sæpe $1\frac{1}{2}$ poll. diam. grosse crenata lobis denticulatis; petiolus 1 poll. longus. *Racemi* simplices terminales pauciflori. *Flores* longe pedicellati; pedicelli $\frac{1}{2}$ poll. longi bracteas excedentes. *Calyx* $\frac{1}{6}$ poll. longus, laciniis lineari-acutis. *Corolla* alba, tubo $\frac{1}{3}$ poll. longo. *Capsula* glabra calyce longior.

Socotra. On the cliffs of the Haghier range at an elevation over 3000 feet. B.C.S. n. 237.

Distrib. Endemic.

It is interesting to have in Socotra a species of this hitherto monotypic and exclusively south African genus. The Socotran species differs from the African plant in its inflorescence, relatively longer corolla, and the capsule exceeding the calyx.

9. CAMPYLANTHUS.

Campylanthus, Roth Nov. Pl. Sp. 4.; Benth. et Hook. Gen. Pl. ii. 961.

A small genus of five species, all of limited distribution; two are Cape de Verde Island species, one is found at Aden and reaches Scindh, one occurs in Scindh and Beloochistan, and the fifth is our Socotran plant. None are known from Africa.

C. spinosus, Balf. fil. in. Proc. Roy. Soc. Edin. xii. (1883), 84. Tab. LXI.

Suffruticosus intricato-ramosissimus incanus spinosus; foliis minutis crassiusculis linearibus obtusis; floribus solitariis subsessilibus axillaribus; corollæ tubo calyce duplolongiore; capsula oblonga glabra.

Suffrutex parvus circa 2-pedalis omnino incanus a basi tortuosus et intricato-ramosissimus ramis ultimis spinosis. *Folia* minuta crassiuscula linearia obtusa persistentia $\frac{1}{6}$ poll. longa $\frac{1}{24}$ poll. lata arcte approximata plerumque plus minusve adpressa et subimbricata apice parum recurvata. *Flores* axillares solitarii sessiles v. subsessiles bracteis multo longiores. *Calyx* $\frac{1}{8}$ poll. longus, laciniis lanceolatis lanato-incanis. *Corolla* purpurea, tubo $\frac{1}{4}$ poll. longo, limbi lobis obcuneato- v. obovato-oblongis. *Capsula* glabra oblonga calyci æquilonga.

Socotra. A very abundant little shrub on the plains near Galonsir and elsewhere. B.C.S. n. 101. Schweinf. n. 261. Hunter.

Distrib. Endemic.

A pretty and very distinct species of the genus. In habit it resembles *C. ramosissimus*, Wight (Ic. t. 1416), a plant of Scindh and Beloochistan. But that species is not so hoary, has pedicellate flowers arranged in racemes, and a nearly orbicular fruit. The other species of the genus are distinguished by their virgate habit.

This is another very interesting find from the point of view of geographical distribution, as all the other species have a limited distribution, and none are African.

10. STRIGA.

Striga, Lour. Flor. Cochinch. 22; Benth. et Hook. Gen. Pl. ii. 968.

A genus of about eighteen species of mostly root-parasites, inhabitants of the tropical regions of the old world. Both the Socotran plants have a wide range in Africa and south-west Asia, and one reaches Australia.

1. S. orobanchoides, Benth. in Comp. Bot. Mag. i. 361, t. 19, and in DC. Prod. x. 501; Ach. Rich. Tent. Flor. Abyss. ii. 129; Wight Ic. t. 1414.

S. orchidea, Hochst. in herb. Kotsch. Nub. n. 387.
Buchnera orobanchoides, R. Br. in Salt. Abyss. app.

For the extensive synonymy of this species see Bentham *loc. cit.*

Socotra. Common on the plains. Parasitic on species of *Vitis*. B.C.S. n. 38. Schweinf. n. 700 in lit.

Distrib. Tropical Africa, south Africa, and north-west India.

2. S. hirsuta, Benth. in DC. Prod. x. 502; Ach. Rich. Tent. Flor. Abyss. ii. 132.

S. lutea, Benth. in Comp. Bot. Mag. i. 363 (non Lour. Flor. Cochinch. 22).
S. pusilla, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1209.
S. gracilis, Miq. Pl. Ind. Or. (ed. Hohenack.) n. 141.
Campuleia coccinea, Hook. Exot. Flor. iii. t. 203.

For the rest of an extensive synonymy see Bentham *loc. cit.*

Socotra. Not uncommon on the plains about Galonsir. B.C.S. n. 142.

Distrib. Throughout India, islands of Indian Ocean, Abyssinia, and tropical Africa, and in Australia.

A very variable species in the colour of its flower; and it has been described under a great number of names. Bentham originally identified this plant with *S. lutea*, Lour.; but that is described as glabrous, and we never observe this character in our plant. In Socotra the flowers vary in tint from white to purple.

11. GRADERIA.

Gradcria, Benth. in DC. Prod. x. 521; Benth. et Hook. Gen. Pl. ii. 970.

A small genus of three species. Hitherto this genus has been considered monotypic, having its only representative in South Africa,—*G. scabra*, Benth.;

but in Kew Herbarium there is a second species, undescribed, found by Welwitsch in Angola, and we have now a third from Socotra. The discovery of our Socotran species necessitates slight emendations in the generic character as given by Bentham and Hooker, to wit,—the habit is shrubby as well as herbaceous, and the stamens may be glabrous as well as villous, with ciliate anthers.

G. fruticosa, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 84. Tab. LXII.

Fruticosa; foliis oblongo-ellipticis v. ellipticis minute aculeolatis; floribus breviter pedicellatis racemos formantibus; corolla sesquipollicari; filamentis et antheris staminum glabris.

Frutex 8–10-pedalis cortice griseo ramulis rigidis scabro-pubescentibus. *Folia* opposita v. 3-verticellata elliptica v. oblongo-elliptica apice obtusa sæpe angustata basi attenuata $\frac{3}{4}$–1 poll. longa $\frac{5}{12}$–$\frac{1}{2}$ poll. lata breviter petiolata margine revoluta coriacea nitida siccitate nigricantia nervis subtus prominulis et utrinque minute aculeolatis; petiolo $\frac{1}{12}$ poll. longo. *Flores* in axillis bractearum foliacearum solitarii breviter pedicellati et racemos elongatos formantes; pedicelli $\frac{1}{6}$ poll. longi scabrido-pilosi. *Calycis* tubus subpoculiformis 10-angulatus angulis prominentibus minute aculeolatis, laciniis tubo æquilongis. *Corolla* atro-purpurea $1\frac{1}{4}$–$1\frac{1}{2}$ poll. longa extus pilis apice capitatis vestita. *Stamina* omnino glabra. *Fructus* loculi basi subæquales. *Semina* minute pilosa.

Nom. Vern. 'Ouherēteh (B.C.S.).

Socotra. Rare on the slopes of the Haghier hills, at an elevation of about 3000 feet. B.C.S. n. 398. Schweinf. n. 634.

Distrib. Endemic.

In this handsome shrub we have another plant of this family, interesting from the point of view of distribution, and affording further striking proof of the close affinity of the south African and this northern flora. The fruit in our plant is much larger and more obliquely acuminate than in the south African species, and the loculi are nearly equal at the base, but towards the apex one rapidly aborts.

We found this on the top of Sicante peaks behind Tamarida. Schweinfurth has it from Kischen. It appears to be rather uncommon.

12. XYLOCALYX.

Xylocalyx, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 84.

Calyx campanulatus, ad medium v. altius 5-fidus, fructifer' accrescens lignascens, laciniis angustis. Corollæ tubus vix exsertus, superne ampliatus, paulum incurvus; limbus patens, lobis 5 latis integris subæqualibus 2 posticis interioribus. Stamina 4, didynama, exserta; antheræ liberæ, glabræ, per paria approximatæ, loculis distinctis parallelis rectis, altero cujusque antheræ tenuiore. Stylus filiformis, apice stigmatoso leviter incrassato obtuso; ovula in loculis numerosa. Capsula basi globosa, apice compressa, calyce aucto inclusa, loculicide dehiscens, valvis integris medio septiferis. Semina numerosa, obcuneata, testa foveolata.—Suffrutex rigidus, lignosus, nanus, minute aculeolatus, siccitate nigricans.

Folia opposita, interdum plura alterna, oblonga v. elliptica, integra. Flores in axillis superioribus subsessiles v. breviter pedicellati, 2-bracteolati. Bracteolæ calyci adhærentes proventu lignascentes.

A genus with remarkable characteristics, especially of the calyx, from which its name is derived. This, which in the flower is soft and leaf-like in texture, and has a pair of small bracteoles adherent slightly above its base, increases in size with the maturation of the fruit, and completely encloses the capsule, at the same time getting hard and woody; and the bracteoles share in this augmentation and hardening, and thus, finally, form a pair of horn-like projections, one on either side near its base.

The technical characters of the genus are those of the *Gerardieæ*, a tribe in which are a number of small genera, readily distinguished by technicalities, but yet so closely allied as to admit, perhaps, when we know a few more forms, of their consolidation into one large genus. But the habit of our plant is different from members of the tribe, and is more like that of some of the *Aptosimeæ*, from which its androecium excludes it.

The most natural position for the genus is in *Gerardieæ*, where it finds its nearest allies in *Sopubia*, *Graderia*, and *Micrargeria*, from all of which its androecium, fruit, and habit readily separate it.

ETYM. ξύλον, wood, and κάλυξ.

X. asper, Balf. fil. *loc. cit.* Tab. LXIII.

Foliis $\frac{1}{4}$–$\frac{1}{3}$ poll. longis $\frac{1}{6}$ poll. latis crassis supra sæpe glabris infra aculeolatis, aculeolis uncinatis albidis ex papulo basali orientibus; calyce $\frac{1}{4}$ poll. longo sub fructu $\frac{1}{2}$ poll. longo; corolla cærulea $\frac{1}{2}$ poll. longa.

Socotra. On the limestone plains and elsewhere. B.C.S. nn. 111, 697.

DISTRIB. Endemic.

From Socotra we have two sets of specimens. One (n. 111) from the plains near Galonsir, and the other (n. 697) from a different locality, but the field-ticket having, unfortunately, been lost, I am not certain of the place of collection, but I believe they are from the hills above Galonsir, on the limestone cliffs. I have been puzzled as to the specific identity or not of the specimens.

n. 111 is a dwarf scrubby undershrub with widely-spreading branched roots and a stem greatly branched, but quite prostrate, hard, gnarled, and knotted. A thoroughly typical desert plant. The fruits are very persistent, and as they wither, beautiful skeletons are formed and remain attached to the branches. The whole plant is covered with very small prickles, but they are not very conspicuous.

n. 697 is a virgately-branched undershrub, covered with coarse prickles and with flowers and fruit larger than in n. 111. The pedicels, too, of the flowers are longer, and the bracteoles in fruit are somewhat softer.

I have concluded, for the present, to regard them as mere forms of the one species, the latter being the more typical.

Order LII. OROBANCHACEÆ.

A small order of parasitic herbs found in most parts of the globe. Most abundant in extratropical regions of the northern hemisphere, but a few species are tropical, and some occur in the southern hemisphere. Both Socotran genera are confined to the old world.

1. CISTANCHE.

Cistanche, Hoffm. et Link Flor. Port. i. 318, t. 63; Benth. et Hook. Gen. Pl. ii. 983.

A small old world genus, with a distribution limited to the Mediterranean region, and west tropical Asia and tropical Africa.

1. C. lutea, Hoffm. et Link. Flor. Port. i. 319, t. 63.

Phelipæa lutea, Desf. Atl. ii. 61, t. 146; Reuter in DC. Prod. xi. 13; Boiss. Flor. Orient. iv. 500.

Socotra. Abundant about Galonsir on species of *Boerhaavia* and other hosts. B.C.S. n. 170.

Distrib. Canary Islands and Mediterranean region to Arabia and Persia; also tropical Africa.

In the date groves, not at all an uncommon plant.

2. C. tubulosa, Wight Ic. t. 1420 *bis*.

Phelipæa tubulosa, Schenk. Pl. Ægypt. Arab. 23; Reuter in DC. Prod. xi. 12; Boiss. Flor. Orient. iv. 500.

Socotra. Near Galonsir. B.C.S. n. 163.

Distrib. Arabia, Scindh, Afghanistan, and northern India.

A specimen we have referred to this species is in a very much decomposed condition, and affords very poor material for examination, and I have some doubt of the identification.

2. OROBANCHE.

Orobanche, Linn. Gen. n. 779; Benth. et Hook. Gen. Pl. ii. 984.

The largest genus of the order and of wide range in the north temperate regions of the old world, much rarer in the tropics and southern hemisphere, and absent from the new world.

1. O. (Osproleon) **abyssinica,** Ach. Rich. Tent. Flor. Abyss. ii. 137.

Nom. Vern. 'Ebbehat (Schweinf.).

Socotra. Frequent on Haghier. B.C.S. n. 333. Schweinf. n. 539.

Distrib. Abyssinia.

Our Socotran plant answers well Richard's description, and resembles

specimens in Kew Herbarium from Abyssinia. It is questionable whether this is a true species. It has general resemblances with several of the south European forms, *O. minor* and its neighbours; and whilst its distinguishing feature is the low insertion of the stamens upon the corolla tube, this is a sexual character of really no specific value.

2. **O.** (Osproleon) **cernua**, Löfl. It. 152; Linn. Sp. 882; Reuter in DC. Prod. xi. 32; Boiss. Flor. Orient. iv. 514; Reichb. Flor. Germ. t. 1808.

Socotra. Very abundant. B.C.S. nn. 372, 720.

Distrib. Mediterranean region eastwards through Arabia and Persia to Afghanistan and northern India; also Australia.

This is the commonest *Orobanche* on the island, and occurs on a variety of hosts.

3. **O.** (Trionychon) **ramosa**, Linn. Sp. 882; Reichb. Iconogr. s. Pl. Crit. 7, t. 693.

Phelipæa ramosa, C. A. Meyer Enum. Pl. Cauc. 104; Reuter in DC. Prod. xi. 8; Ach. Rich. Tent. Flor. Abyss. ii. 136; Boiss. Flor. Orient. iv. 498.

Socotra. On *Lactuca*, near Galonsir. B.C.S. n. 126.

Distrib. Europe, and from the Canary Islands through the Mediterranean region to Arabia, and in Abyssinia and south Africa.

A widely-spread species. As it occurs on Socotra it assumes the small simple unbranched form with dense spikes to which Boissier (*loc. cit.*) gives the varietal name "nana"; a variety hitherto reported only from the sandy plains of Syria in the vicinity of Sidon.

Order LIII. PEDALINEÆ.

A small order of herbs, rarely half shrubby, inhabiting the warmer regions of both hemispheres, but most frequent in Africa.

PEDALIUM.

Pedalium, Linn. Gen. n. 794; Benth. et Hook. Gen. Pl. ii. 1056.

A monotypic genus of the Indian Peninsula, south-west Asia, and tropical Africa.

P. Murex, Linn. Sp. 892; DC. Prod. ix. 256; Wight Ic. t. 1615.

Socotra. Frequent on the plains about Galonsir, Tamarida, and elsewhere. B.C.S. n. 18. Schweinf. n. 350.

Distrib. Of the genus.

Order LIV. ACANTHACEÆ.

A large order of the tropical and warmer regions of the globe, rarely found in temperate regions. The order has a remarkable development in Socotra. Twenty-seven species in all are known from the island, and they are referable to fifteen genera. Of the genera, three are endemic, one of them being represented by three species, and another by two. Of the remaining twelve, one is only known from Arabia, seven are entirely African and Asiatic in distribution two of them reaching to Madagascar, one is a widely-spread old world tropical genus, and the rest are dispersed more or less widely over the tropics and warmer regions of the whole globe.

1. RUELLIA.

Ruellia, Linn. Gen. n. 784; Benth. et Hook. Gen. Pl. ii. 1077.

A large genus of often showy plants, having its headquarters in tropical America, but spread throughout warmer regions of both the old and new worlds. Of our Socotran species, two are endemic, and the third is a widely-spread south-west Asiatic and tropical African species which occurs also in Madagascar.

1. **R. patula**, Jacq. Misc. Bot. ii. 358, and Ic. Pl. Rar. i. t. 119; T. Anders. in Journ. Linn. Soc. vii. (1864), 24, and ix. (1867), 460.

R. matutina, Hochst. et Steud. in herb. Schimp. Arab. n. 874.
Dipteracanthus patulus, Nees ab. Esenb. in DC. Prod. xi. 126; Wight Ic. t. 1505.
D. erectus, Nees ab. Esenb. in Wall. Pl. As. Rar. iii. 82.

Socotra. On the plains near Galonsir and elsewhere. B.C.S. n. 184. Schweinf. nn. 452, 781 in lit. Nimmo.

Distrib. Indian Peninsula and south-west Asia, tropical Africa and Madagascar.

All the Socotran specimens of this common plant show small-leaved prostrate forms, with the flowers solitary in the leaf-axils, and the fruits somewhat smaller than in the type.

There are three well-marked forms on the island.

The first (our n. 184, Schweinf. n. 452) has the clothing of the type, and is like some of the Arabian plants, and those of Nimmo in Kew Herbarium.

The second set of specimens are from an altogether more densely pubescent plant; very thickly pubescent it is, with rounded, obtuse leaves, and the corollas one-third larger than in the foregoing form; the style, too, is at least a third longer, and has more expanded lobes. The plant from Nile Land collected by Speke and Grant, referred to this species by Oliver (in Trans. Linn. Soc. xxix. (1875), 127), is probably our form. It may be well described as a variety, as follows:—

var. **pubescens**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Dense pubescens, foliis obtusis subrotundis.

Socotra. B.C.S. n. 579. Schweinf. n. 614.

DISTRIB. Nile Land.

A third set of specimens are distinguished from those mentioned, and from all other forms of the species, by their stunted habit, hoary covering, and by the small size of the flowers and fruits. The corolla is not more than a half-inch, and the fruit is only a quarter-inch long. The leaves and other parts are small in proportion. We may describe this also as a variety, thus :—

var. **minor**, Balf. fil. in Proc Roy. Soc. Edin. xiii. (1883).

Nana canescens; foliis floribusque parvulis; corolla vix $\frac{1}{2}$ poll. longa; fructu $\frac{1}{4}$ poll. longo; seminibus $\frac{1}{2}$ poll. diam.

Socotra. B.C.S. nn. 270, 728.

DISTRIB. Endemic.

2. **R. insignis**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 85. Tab. LXIV.

Fruticosa; foliis petiolatis ellipticis v. subrhomboideis obtusis, lamina glabra supra papulosa cystolithifera; floribus axillaribus solitariis; bracteolis calyce viscido brevioribus viscidis; corolla magna; capsula 4-sperma.

Frutex 6-10-pedalis multo breviterque ramosus cortice griseo plus minusve verrucoso ramulis ultimis quadrangulatis puberulis. *Folia* petiolata elliptica v. subrhomboidea rarius subrotundata plerumque versus extremitates angustata obtusa $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa $\frac{1}{2}$–1 poll. lata sæpius minora margine undulata crenulata coriacea lamina glabra supra papillosa et cystolithis notata siccitate nigricante infra pallidiore, petiolo $\frac{1}{2}$–$\frac{3}{4}$ poll. longo striguloso. *Flores* in axillis foliorum superiorum solitarii pedicellati; pedicelli petiolo bracteæ subæquilongi $\frac{1}{6}$ poll. longi quadrangulati pubescentes. *Bracteolæ* oblongæ v. oblanceolatæ $\frac{1}{3}$ poll. longæ $\frac{1}{8}$ poll. latæ calyce breviores pilis viscidis glandulis capitatis dense vestitæ, in axillis villosæ. *Calyx* $\frac{2}{3}$ poll. longus profunde 5-partitus, segmentis linearibus apice angustatis pilosis et pilis glandulis capitatis viscidis vestitis. *Corolla* lilacina magna infundibularis, tubo $1\frac{1}{4}$ poll. longo inferne cylindraceo superne ventricoso intus glabro extus sparsim piloso, limbi lobis rotundatis $\frac{1}{4}$ poll. longis. *Stamina* stylo breviora inclusa; antheræ $\frac{1}{8}$ poll. longæ. *Ovarium* glabrum; stylus 1 poll. longus puberulus sursum complanatus. *Capsula* glabra nitida clavato-pyriformis $\frac{3}{4}$ poll. longa calyce longior apice punctata, stipite $\frac{1}{6}$ poll. longo. *Semina* 4 orbiculata fusco-tomentosa.

NOM. VERN. Ojehit (B.C.S.). Sizhin (Schweinf.).

Socotra. Common on the Haghier hills. B.C.S. n. 376. Schweinf. n. 490.

DISTRIB. Endemic.

A very distinct species, differing in foliage from all old world forms, and, indeed, from all other species in the genus.

It is one of the largest-flowered plants on the island, and one of the most beautiful. Unfortunately, none of the seeds we brought home have germinated, and Messrs Haage and Schmidt inform me they have failed to raise it from the seed sent by Schweinfurth.

3. **R. carnea,** Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 85. Tab. LXV.

Fruticosa dense stellatim tomentosa et viscida; foliis cordatis; floribus solitariis axillaribus; bracteolis calyce brevioribus; corolla magna; capsula pubescente.

Frutex parvus albido-incanus omnino stellatim tomentosus indumento facile detecto viscidus pilis apice glanduloso-capitatis inter pilos stellatos suffultus, ramis adscendentibus strictis angulatis canaliculatis. *Folia* petiolata cordata v. rotundato-cordata $1\frac{1}{4}$ poll. longa $\frac{3}{4}$-poll. lata obtusa rare basi truncata integra subtus venulis prominulis. *Flores* viscidi in axillis foliorum superiorum solitarii pedicellati; pedicelli $\frac{1}{2}$–$\frac{3}{4}$ poll. longi stricti adscendentes. *Bracteolæ* subspathulatæ $\frac{1}{3}$ poll. longæ calyce breviores. *Calyx* $\frac{1}{2}$ poll. longus profunde partitus, segmentis lineari-lanceolatis obtusis intus villosis margine piloso-ciliatis. *Corolla* magna carnea extus puberula, tubo 1 poll. longo inferne subcylindrico superne parum ampliato, limbi lobis oblongo-rotundatis $\frac{2}{3}$ poll. longis. *Stamina* exserta stylo longiora; antheræ $\frac{1}{6}$ poll. longæ. *Ovarium* pubescens; stylus $1\frac{1}{3}$ poll. longus puberulus. *Capsula* $\frac{2}{3}$ poll. longus $\frac{1}{3}$ poll. diam. calyce longior ovoidea punctata pubescens, stipite $\frac{1}{8}$ poll. longo.

Socotra. On the plains near Galonsir. B.C.S. n. 510. Schweinf. n. 714.

Distrib. Endemic.

A most marked species, with lovely large red flowers, easily distinguished from all others by its indumentum, and from most by the form of its leaves. In this latter character it agrees with *R. Currori,* T. Anders. (in Journ. Linn. Soc. vii. (1864), 24), an imperfectly known plant of west tropical Africa, its nearest ally; but it may be readily separated by the mode of branching, indumentum, and other minor characters. It is not common on Socotra.

2. BLEPHARIS.

Blepharis, Juss. Gen. n. 103; Benth. et Hook. Gen. Pl. ii. 1089.

A genus of rigid, often prickly herbs or shrubs, natives of tropical and south Africa and of India. Of the Socotran species, one is endemic and the other is spread in tropical Africa, south-west Asia, and Ceylon.

1. **B. boerhaaviæfolia,** Juss. in Pers. Synops. ii. 180; Nees ab. Esenb. in DC. Prod. xi. 266; Ach. Rich. Tent. Flor. Abyss. ii. 150; T. Anders. in Journ. Linn. Soc. vii. (1864), 34, and ix. (1867), 500; Franch. Sert. Somal. in Miss. Révoil. 53; Wight Ic. t. 458.

B. abyssinica, Hochst. in herb. Schimp. Abyss. sect. i. n. 247, sect. iii. nn. 1492, 1895.

Socotra. On the plains. B.C.S. n. 331. Schweinf. n. 319.

Distrib. Tropical Africa, Arabia, Indian Peninsula, and Ceylon.

All our specimens are of a plant with not very wiry stems, and with small flowers and seeds, only slightly shaggy at the apex; in some points resembling *B. molluginifolia,* Juss. (Nees ab. Esenb. in Wall. Pl. As. Rar. iii. 97). Abyssinian specimens of this species have usually firmer leaves, and much more longly ciliate bracts, than in the type and in our specimens. The species is one which in tropical Africa apparently passes through many well-marked varieties.

2. B. spiculifolia, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 85. Tab. LXVI.

Fruticosa nana ramulis lateralibus contractis; foliis rigidis oblanceolatis v. sublinearibus rarius subhastatis spinosis; floribus solitariis terminalibus; bracteolis calyce brevioribus; calycis lobis integris.

Frutex nanus prostratus rigidus lignosus intricato-ramosus cortice griseo sublepidoto, caule valido ramisque elongatis superne marcescentibus inferne ramulos contractos laterales plures gerentibus. *Folia* vix petiolata, ad ramos elongatos 4-verticellata 2 oppositis minoribus, ad contractos confertim in lineas 4 spirales dextrorsum versas evoluta, parva $\frac{1}{2}$–$\frac{2}{3}$ poll. longa $\frac{1}{12}$ poll. lata oblanceolata v. linearia versus extremitates ambos attenuata apiceque subulata spiculata haud raro subhastata basi longe attenuata cum margine utroque in spiculum suboppositum producto nitida nervo medio dorsaliter prominulo venulis longitudinaliter striata viridia pubibus albis brevissimis capitatis obscure puberula nervoque medio supra substriguloso. *Flores* ad apices ramulorum contractorum solitarii sessiles. *Bracteolæ* acerosæ spiculosæ puberulæ $\frac{1}{4}$ poll. longæ. *Calyx* 4 partitus, segmentis rigidis cuspidato-spiculatis obscure puberulis margine membranaceis, latioribus subæqualibus longe ovatis $\frac{2}{5}$ poll. longis integris lateralibus oblongis $\frac{1}{4}$ poll. longis. *Corolla* flava, tubo $\frac{1}{5}$ poll. longo dorsaliter truncato fauce constricta et annulo villoso cincta, limbo $\frac{5}{12}$ poll. longo venuloso extus glabro intus breviter villoso panno glabro centrali excepto. *Stamina* exserta, filamentis supra annulum corollæ affixis validis pilosis. *Ovarium* glabrum disco parvulo cupulaeformi cinctum; stylus $\frac{1}{4}$ poll. longus bidentatus. *Capsula* ovoidea compressa glabra nitida $\frac{1}{4}$ poll. longa. *Semina* obliqua oblonga hirta $\frac{1}{8}$ poll. longa.

Socotra. On the plains near Tamarida. B.C.S. n. 183. Schweinf. n. 442.

DISTRIB. Endemic.

A peculiar and very distinct species, differing slightly from the generic type in the anterior and posterior calyx lobes, which are entire and not toothed, and in the presence of a villous ring around the throat of the corolla tube, but undoubtedly referable to this genus.

Its foliage is remarkable. Each leaf is a small rigid sharply-pointed dart, sometimes taking on a halbert shape, with a spicule developed on each margin. The leaves are easily detached, and the plant is therefore a most objectionable one in the scrub.

3. BARLERIA.

Barleria, Linn. Gen. n. 785; Benth. et Hook. Gen. Pl. ii. 1091.

A considerable genus of often prickly herbs and shrubs, chiefly tropical Asiatic and tropical and south African. A few are natives of the tropics of the new world. In Socotra we find three endemic species.

1. B. aculeata, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 85. Tab. LXVII.

Fruticosa non-spinosa fere glabra; foliis petiolatis obovatis v. subellipticis coriaceis aculeatis; floribus axillaribus solitariis; bracteolis calyce brevioribus; staminibus 2; staminodiis 3; capsula obovoidea basi vix contracta 4-sperma.

Frutex parvus 4-6-pedalis rigidus lignosus. *Folia* opposita breviter petiolata persistentia obovata basi cuneata v. subelliptica v. subrotundata apice cuspidato-aculeata margine in-

crassata late undulata integra v. grosse aculeata ½-¾ poll. longa ¼-⅝ poll. lata sæpe multo minora recurva glabra supra grosse papulata subtus pallidiora rigida coriacea, petiolo $\frac{1}{10}$-⅛ poll. longo obscure puberulo. *Flores* in axillis solitarii breviter pedicellati; pedicelli petiolo æquilongi obscure puberuli. *Bracteolæ* ⅕ poll. longæ anguste ovatæ v. lanceolatæ medio nervo prominulo in aculeum apicalem producto. *Calyx* 4-partitus, segmentis latioribus ½ poll. longis ⅕-¼ poll. latis late obovatis v. ellipticis apice cuspidato-aculeatis venulis a basi sursum currentibus prominenter anastomosantibus pilis minutissimis capitatis etiamque punctatis obscure puberulis, lateralibus ⅓ poll. longis lanceolatis longe acutis membranaceis reticulato-venulosis glanduloso-puberulis. *Corolla* lilacina extus pubescens pilis apice capitatis glandulosis, tubo ½ poll. longo inferne cylindrico sursum ampliato, limbo 5-lobato patente lobis obovatis obtusis crenulatis anticis 2 minoribus lateralibus exterioribus. *Stamina* 2 antica perfecta ¾ poll. longa exserta fauci affixa, filamentis validis angulatis basi dilatatis pilosis; antheræ dorso affixæ sagittatæ ⅛ poll. longæ; staminodia 3 postica acerosa lanceolota ⅛ poll. longa. *Discus* conspicuus cupulæformis dentatus. *Ovarium* glabrum loculis 2-ovulatis; stylus ⅚ poll. longus apice dentatus. *Capsula* ½ poll. longa obovoidea punctata basi vix contracta complanata glabra nitida nigra. *Semina* 4 v. abortu pauciora orbiculata ⅕ poll. diam. indumento vestita, retinaculis glabris acutis.

Nom. Vern. Sheitan-erēteh (B.C.S.).

Socotra. Common on the north slopes of the Haghier range. B.C.S. nn. 399, 408. Schweinf. nn. 553, 576 in lit.

Distrib. Endemic.

An interesting novelty, and one of the prettiest flowering plants on the island. Its habit and prickly coriaceous foliage readily distinguish it from all known species.

2. **B. tetracantha**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 85. Tab. LXVIII.

Fruticosa nana glabra ramis lateralibus axillaribus verticellatim tetracanthis; foliis crassis lanceolatis oblanceolatis v. obovatis apice aculeatis; floribus axillaribus; bracteolis pungente-subulatis calyci æquilongis; staminibus 4, 2 brevioribus; ovarii loculis 1-ovulatis.

Suffrutex glaber nanus spinosus radice valido lignoso, caule duro multo brevissimeque ramosissimo cortice griseo, ramis sæpe prostratis ultimis paucis elongatis tetragonis leprosis laterales ramulos axillares basi rigidos albos ⅓-½ poll. longos apiceque verticillatim 4-spinosos gerentibus spinis divaricatis subulatis albis primum substrigulosis rhachi æquilongis v. brevioribus rarius longioribus. *Folia* lanceolata v. oblanceolata vix petiolata sed versus extremitates ambos angustata apiceque aculeata basi gradatim attenuata ¾–1 poll. longa ⅕-¼ poll. lata v. sæpe minora ½ poll. longa ⅙ poll. lata et obovata v. subelliptica et aculeatim mucronata subcrassa glauca glabra venulis marginibusque obscure strigulosis. *Flores* solitarii v. in spicas 2-floras dispositi subsessiles in axillis foliorum nonspiniferûm (rarius spiniferûm) superiorum; bracteæ foliaceæ calyce longiores. *Bracteolæ* 2 trigono-subulatæ apice aculeatæ basi anguste marginatæ subconnatæ sparsim strigulosæ. *Calyx* alte 4-fidus, lobis integris intus strigosis margine striguloso-ciliatis, anticis posticisque paulum latioribus, exterioribus basi expansis rotundatis sursum longe acuminatis in aculeos productis, interioribus lineari-lanceolatis apice aculeatis. *Corolla* ¾ poll. longa, tubo ½ poll. longo basi paulum dilatato supra basim incurvo medio leviter constricto ibique annulo

villoso interne cincto extus pubescente, limbi lobis subæqualibus lateralibus exterioribus ellipticis acutis integris. *Stamina* 4 longiora $\frac{1}{3}$ poll. longa, breviora $\frac{1}{5}$ poll. longa, filamentis puberulis; antheræ omnes 2-loculares basi sagittatæ. *Discus* conspicuus minute dentatus. *Ovarium* glabrum loculis 1-ovulatis; stylus $\frac{5}{6}$ poll. longus integer obtusus sub apice tumidus. *Capsula* immatura rostrata. *Semina* 2.

Socotra. On the plains abundant. B.C.S. n. 605. Schweinf. n. 374.

Distrib. Endemic.

This species belongs to the two-seeded group of the genus, and is remarkable in having only two ovules in the ovary, one in each cell. This is a most unusual character in the order, indeed I can find such a condition described in no other genus. Our specimens are not very large, and we have not many flowers, but I have found this uniovular condition of the ovarian cells in all those I have examined. The most distinguishing other features of our plants are the narrow four-branched spine-branches in the leaf-axils, and the narrow linear-subulate spiny bracteoles. By all these it is readily separable from *B. triacantha*, Hochst., and other allied forms.

It is a very characteristic plant of the plains, and forms an unpleasant impediment to any one traversing them, for the small stunted woody stem projects frequently but a few inches above the ground, and over it one is apt to trip.

3. B. argentea, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 86.

Fruticosa inermis argentea canescens; foliis lanceolatis v. oblanceolatis strigulosis acutis v. submucronulatis; floribus in cymas bifloras axillares pedunculatas dispositis; bracteolis lineari-subulatis calyce brevioribus; staminibus 2; staminodiis 2; ovarii loculis 1-ovulatis; capsula rostrata pubescente 2-sperma.

Suffrutex inermis a basi intricato-ramosus, caulibus ramisque argenteo-canescentibus, ramis sæpe decumbentibus ramulis rigidis adscendentibus. *Folia* petiolata v. subsessilia lanceolata v. oblanceolata v. lineari-lanceolata versus extremitates ambos angustata $\frac{3}{4}$ $1\frac{1}{6}$ poll. longa $\frac{1}{8}$–$\frac{1}{6}$ poll. lata apice acuta v. submucronata basi gradatim attenuata integra omnino sparsim v. nervo medio marginibusque solum strigosa. *Flores* in cymas trifloras (rarius 1) pedunculatas in axillis superioribus dispositi, flore singulo sessili, pedunculo $\frac{1}{4}$ poll. longo; bracteæ lineari-lanceolatæ strigosæ. *Bracteolæ* 2 lineari-subulatæ v. acerosæ strigosæ calyce multo breviores. *Calyx* basi puberulus alte 4-fidus, segmentis lanceolatis longissime acutis extus strigosis intus nitidis inæqualibus, postico maximo $\frac{1}{3}$ poll. longo, lateralibus minimis $\frac{1}{6}$ poll. longis. *Corolla* parva $\frac{5}{6}$ poll. longa extus pubescens, tubo $\frac{1}{10}$ poll. longo basi dilatato intus glabro, limbi lobo antico altius soluto $\frac{1}{10}$ poll. longo obovato emarginato, postico breviter lobato segmentis obtusis subæqualibus lateralibus extimis. *Stamina* 2 perfecta exserta, filamentis glabris supra basin corollino tubo affixa; antherarum lobi basi divergentes; staminodia minuta inconspicua. *Ovarium* inferne in disco bilobato lobis ovatis immersum superne pubescens, loculis 1 ovulatis; stylus apice obtusus incrassatus. *Capsula* $\frac{3}{10}$ poll. longa subcompressa pubescens sessilis superne in rostrum solidum contracta inferne 1-sperma. *Semina* vestita, retinaculis acutis subuncinatis.

Nom. Vern. Shiamham (B.C.S.).

Socotra. On the Kadhab plain. B.C.S. n. 544.

DISTRIB. Endemic.

A third and very distinct species I have placed in this genus. Like the foregoing it belongs to the two-seeded section of the genus in which the fruit is beaked, and like it is exceptional in the order, as there is but one ovule in each cell of the ovary. The two species have no very close affinity, one with the other, and it is therefore all the more remarkable to find this unusual character developed in both of them.

4. NEURACANTHUS.

Neuracanthus, Nees ab. Esenb. in Wall. Pl. As. Rar. iii. 76, and in DC. Prod. xi. 248; Benth. et Hook. Gen. Pl. ii. 1093.

A small genus of, rarely spiny, herbaceous or half-shrubby species, of which two or three are tropical African, two are endemic in Socotra, and the rest are Indian.

N. aculeatus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 86. Tab. LXIX, A.

Suffruticosus incanus $\frac{1}{2}$–1-pedalis ramulis brevibus; foliis linearibus sinuato-undulatis; spicis axillaribus brevibus; bracteis apice lignosis subulato-pungentibus.

Suffrutex aculeatus erectus sæpe subprostratus $\frac{1}{2}$–1-pedalis incanus dense lanato-pubescens multo intricatoque ramosus, ramis brevibus. *Folia* mollia breviter petiolata sæpe ad extremitates ramulorum rosulata linearia sinuato-undulata obtusa 1 poll. longa. v. minora $\frac{1}{6}$ poll. lata crassa subinvoluta nervo medio subtus prominulo. *Flores* in spicas breves 1–1$\frac{1}{2}$ poll. longas axillares haud raro ramosas dispositi; bracteæ floribus longiores $\frac{1}{4}$–$\frac{1}{2}$ poll. longæ basi ellipticæ amplexicaules nervo medio lignoso et in aculeum subulatum longum recurvum producto plus minusve lanatæ, basales sæpe cassæ. *Bracteolæ* 0. *Calyx* sub fructu auctus 2-lobatus, lobis involutis inæqualibus lanceolatis v. anguste-ellipticis, postico $\frac{1}{5}$ poll. longo $\frac{1}{12}$ poll. lato 3-nervio apice 3–5-fido segmentis subulatis pungentibus, antico minore bifido segmentis pungentibus. *Corolla* $\frac{1}{4}$ poll. longa infundibuliformis extus dense lanato-pubescens intus postice glabra antice villosa, tubo cylindrico, limbo expanso patente minute 5-lobato plicato lobis acutis posticis 2 altius connatis. *Stamina* 4 didynama fauci affixa per paria basi subconnata, filamentis brevibus; antheræ muticæ anticorum longiorum perfecte 2-loculares loculis distinctis altero altiore villoso ciliato, posticorum minores 1-loculares v. loculo secundo imperfecto. *Discus* inconspicuus. *Ovarium* glabrum apice paulum productum; stylus validus basi tumidus apice obliquus expansus obovoideus antice cavus stigmatiferus; ovula in quoque loculo 2. *Capsula* glabra oblonga v. anguste ovata apice angustata $\frac{2}{5}$ poll. longa a basi vix contracta 2-locularis septo parallelis compressa basi et ad medium seminifera. *Semina* 4 apice paulum marginata $\frac{1}{12}$ poll. longa retinaculis acutis fulta.

Socotra. A plant of the plains. B.C.S. n. 502.

DISTRIB. Endemic.

A plant possessing so fully the technical characters of this genus that I am constrained to place it here, although in habit it differs entirely from the type, and indeed from any species included in the genus. It is a very characteristic

hoary and prickly plant of the Socotran plains, and is a rather unpleasant scrub plant, for its close-set branches with soft leaves bear large numbers of flower-spikes, the bracts of which all terminate in sharp prickles. The common habit in the genus is a more or less glabrous, erect herb, with large leaves and bracts hardly, if at all, prickly. Beyond habit, there are few divergences from the generic character in our plant. One may note, however, that the stamens are exserted, not included, the style is tumid at the base, and there are never more than two ovules in each ovarian loculus.

2. N. capitatus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 86. Tab. LXIX, B.

Suffruticosus incanus nanus ramis elongatis decumbentibus; foliis ellipticis v. obovatis sinuato-undulatis; spicis congestis in inflorescentias capitatas aggregatis; bracteis angustis apice subulato-pungentibus.

Suffrutex sæpe congestus subcæspitosus radice longo recto lignoso incanus a collo ramosus ramis late patentibus decumbentibus ramulos laterales contractos multos gerentibus. *Folia* elliptica v. ovata v. obovata obtusa crenata sinuato-undulata, basi abrupte in petiolum brevissimem contracta v. gradatim attenuata $\frac{5}{6}$–$\frac{2}{3}$ poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata mollia pubescente-tomentosa ad apices ramulorum contractorum sæpe rosulata. *Flores* spicas breves formantes plures ad extremitates ramulorum lateralium capitatim congestas; bracteæ angustæ apice in aculeum subulatum productæ $\frac{1}{4}$ poll. longæ. *Calycis* lobi post anthesin elliptici dense lanati apice aculeati fimbriati. Cæt. ignot.

Socotra. On Kadhab plain. B.C.S. n. 360.

Distrib. Endemic.

Another plant of the dry limestone regions. Unfortunately we have only imperfect specimens. The flower spikes are all withered and partly rotted, and I have not been able to find any flowers, nor get a perfect fruit. Yet the plant undoubtedly belongs to the same genus as the foregoing, from which it differs in having short spikes all clustered in dense globose heads at the end of short lateral branches borne upon long spreading shoots with broader and shorter leaves. This and the foregoing species stand quite alone in the genus, but this second species approaches in the arrangement of its inflorescence, though at a considerable distance, some of the tropical African forms.

The heads of spikes are a marked feature in this species. As one finds the plant on the plains, the trailing branches appear as if studded all over with burrs; for when dry the spikes in each cluster all close in over one another after the manner of the branches of the rose of Jericho, and like them when placed in water they expand.

5. ASYSTASIA.

Asystasia, Blume Bijdr. 796; Benth. et Hook. Gen. Pl. ii. 1094.

A small genus of tropical and south African and Asiatic species, many having a considerable area of distribution.

A. coromandeliana, Nees ab. Esenb. in Wall. Pl. As. Rar. iii. 89, and in DC. Prod. xi. 165.

Justicia gangetica, Linn. Amœn. Acad. iv. 299.

Socotra. A common weed. B.C.S. n. 468. Schweinf. nn. 330 in lit., 479.

Distrib. A widely-dispersed weed of tropical Africa, Arabia, India, and Malay.

A very variable species. Our specimens are delicate, with slender branching stems, tender membranous leaves, and short racemes of flowers, the corollas of which are little more than one-third of an inch long. Many of the tropical African forms are slender, but possibly when these are worked out more than one species may be found included under this name.

6. BALLOCHIA.

Ballochia, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 86.

Calyx 5-partitus, segmentis angustis acutis subæqualibus. Corollæ tubus longiusculus, recurvatus, extus pubescens, intus glanduloso-puberulus, fauce ampla; limbus 2-labiatus, labio postico exteriore oblongo erecto concaviusculo breviter 2-lobato, antico 3-partito segmentis planis inter se subæqualibus lateralibus erectis intermedio intimo patente. Stamina 2 antica perfecta, fauci affixa, labio postico paulum breviora v. sublongiora, filamentis decurrentibus validis complanatis postice cum staminodiis parvis sublinearibus uncinatis subconnatis; antheræ 1-loculares, oblongæ, medio dorso affixæ, muticæ, apertæ late membranaceæ. Discus pulvinatus. Stylus filiformis, apice integer obtusus v. brevissime bifidus; ovula in quoque loculo 3. Capsula oblonga, basi in stipitem solidum longe contracta. Semina 4 v. abortu pauciora, compressa, suborbiculata, rugosa, scrobiculata, retinaculis tenuibus fulta; embryo normalis.—Frutices elati v. humiles, lignosi, rigidi; inflorescentia glanduloso-puberula excepta glabri. Folia parva, integerrima, crassa, Flores flammeo-flavi. v. flavidi, pedicellati, in axillis solitarii v. dichasia axillaria simplicia formantes. Bracteæ minimæ, angustæ.

A very distinct genus of the *Eujusticieæ* section of the tribe *Justicieæ,* and belonging to a group of genera characterised by the possession of two stamens with one-celled muticous anthers. *Oreacanthus,* a monotypic genus of the Cameroon mountains, is its nearest ally, but in addition to several technical characters—such as the axillary inflorescences, the external posterior lobes of the corolla limb, the staminodes—in which our plant differs from that genus, the habit and general facies of the plants render their combination in one genus impracticable.

Monothecium, an Abyssinian and Indian genus, *Ruttya,* a tropical and south African one, and *Brachystephanus,* from Madagascar and tropical Africa, are all genera of the set to which *Ballochia* belongs, but the first of these has linear setaceous bracts, the second has appendaged anthers, and the third has the posterior corolline lobe internal, whilst all of them have more or less spicate inflorescences. Thus by technical character they are sufficiently diagnosed, and besides, in habit they are readily and completely distinguished.

There are three quite distinct species of the genus on the island.

ETYM. Dedicated to Robert Balloch, Esq., Glasgow, a keen student of Botany in his earlier years, to whom, whilst working out this flora, I have been much indebted for many kindnesses.

1. B. amœna, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 87. Tab. LXX.

Virgata ramulis albis sæpe subspinescentibus; foliis parvis subsessilibus oppositis v. fasciculatis oblongis obtusis margine revolutis; floribus solitariis axillaribus pedicellatis; pedicellis foliis longioribus glandulosis; stylo apice bifido.

Erecta virgata 8-pedalis ramulis albidis sæpe versus extremitatem marcescentibus subspinescentibus, lateralibus haud raro contractis. *Folia* parva subsessilia ad ramos elongatos opposita, ad contractos fasciculata, oblonga v. obovata v. elliptica v. subovata $\frac{1}{4}$–$\frac{1}{3}$ poll. longa $\frac{1}{6}$ poll. lata obtusa rarius apiculata v. emarginata integra margine revoluta siccitate cystolithis papillosa. *Flores* in axillis solitarii; pedicelli $\frac{2}{3}$ poll. longi sparse glandulosi. *Calyx* $\frac{1}{4}$ poll. longus, laciniis longe acutis glanduloso-puberulis. *Corolla* flammeo-flavida v. flavida $1\frac{1}{4}$ poll. longa. *Stamina* corolla vix longiora; staminodia $\frac{1}{12}$ poll. longa. *Stylus* pollicaris apice breviter bifidus glaber. *Capsula* glabra $\frac{7}{12}$–$\frac{3}{4}$ poll. longa.

NOM. VERN. Mīsah (B.C.S.).

Socotra. Near Kadhab, and near Tamarida. B.C.S. nn. 364, 430. Schweinf. nn. 419 in lit., 648, 780. Hunter.

DISTRIB. Endemic.

A pretty species found in several places, both on the plains and on the hill slopes. Schweinfurth sends two sets of specimens, one of which (n. 780), he notes as having entirely yellow flowers. These flowers have also a somewhat longer corolla-tube, which is considerably more enlarged in the throat than is usual.

This is the smallest leaved of the species of this genus, and by this character as well as its virgate, sometimes half-spiny, twigs, it is easily distinguished.

2. B. rotundifolia, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 87. Tab. LXXI, A.

Subarborea nonnunquam nana ramulis obscure alatis; foliis brevissime petiolatis late ovatis v. subrotundatis acutis v. obtusis margine revolutis subtus albido-lepidotis; floribus in dichasia axillaria dispositis rarius solitariis; pedicellis longis glanduloso-puberulis; stylo apice obtuso integro.

Elata subarborea ramis elongatis nonnunquam nana ramisque brevibus intricatis lignosis, ramulis obscure alatis. *Folia* brevissime petiolata late ovata v. subrotundata v. obovata interdum elliptica rarius lanceolata $\frac{2}{3}$ poll. longa $\frac{5}{12}$–$\frac{1}{2}$ poll. lata, in forma nana sæpe rotundata $\frac{1}{4}$ poll. diam., acuta v. obtusa basi rotundata v. cordiformia integra margine revoluta siccitate cystolithis papillosa subtus pallidiora albido-lepidota, petiolo vix $\frac{1}{6}$ poll. longo. *Flores* plerumque in dichasia axillaria dispositi rarius solitarii; pedunculi $\frac{1}{4}$–$\frac{1}{3}$ poll. longi cum pedicellis $\frac{1}{3}$–$\frac{1}{2}$ poll. longis glanduloso-puberulis. *Calyx* $\frac{2}{3}$ poll. longus, laciniis acutis dense glanduloso-puberulis. *Corolla* 1 poll. longa. *Stamina* corolla brevior; staminodia $\frac{1}{24}$ poll. longa. *Stylus* apice integer obtusus. *Capsula* $\frac{5}{6}$ poll. longa.

Socotra. A shrub or small tree of the Haghier hills, and also on the limestone plateaux south-west from Galonsir at an elevation of over 1500 feet. B.C.S. nn. 300, 529. Schweinf. n. 605.

DISTRIB. Endemic.

Like so many other plants this species exhibits a dwarfed intricately-branched small-leaved form (n. 529) on dry limestone regions, and a more twiggy erect habit with larger leaves in regions with a more favourable soil. Its flowers are very pretty, and it may be at once diagnosed from the other species by its rounded leaves, and the cymose axillary inflorescence.

3. **B. atro-virgata,** Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 87. Tab. LXXI, B.

Erecta ramulis strictis nigris; foliis brevissime petiolatis elongato-oblongis v. oblanceolatis obtusis margine undulatis subtus glaucis; floribus solitariis axillaribus; pedicellis foliis multo brevioribus glabris; stylo apice breviter bifido.

Frutex erectus ramulis strictis nigris lenticellatis. *Folia* brevissime petiolata opposita oblonga v. oblanceolata rarius subobovata $\frac{3}{4}$–1 poll. longa $\frac{3}{10}$–$\frac{1}{3}$ poll. lata apice obtusa rarius emarginata basi abrupte contracta margine undulata subtus glauca siccitate cystolithis papillosa nervoque medio albo-punctulato, petiolo $\frac{1}{24}$ poll. longo. *Flores* solitarii axillares; pedicelli $\frac{1}{6}$–$\frac{1}{5}$ poll. longi glabri. *Calyx* $\frac{1}{8}$ poll. longus, laciniis acutis extus glabris intus strigulosis. *Corolla* $1\frac{1}{12}$ poll. longa. *Stamina* corolla breviora; staminodia $\frac{1}{16}$ poll. longa. *Stylus* apice breviter bifidus glaber. *Capsula* pollicaris. *Semina* $\frac{1}{4}$ poll. diam.

Socotra. In several localities on the hill slopes. B.C.S. n. 255.

DISTRIB. Endemic.

A third pretty-flowered species of this genus, readily recognised by its persistently oblong leaves, which are longer than in the other species, and by its very conspicuous black twigs.

7. JUSTICIA.

Justicia, Linn. Gen. n. 27; Benth. et Hook. Gen. Pl. ii. 1108.

A large genus of polymorphous species widely dispersed over the warmer regions of the globe. One of the Socotran species is endemic, the other is a remarkable south-west Asiatic and north-east African species.

1. **J. (Harnieria) heterocarpa,** T. Anders. in Journ. Linn. Soc. vii. (1864), 41.

Rostellularia heterocarpa, Hochst. in herb. Schimp. Abyss. (ed. Hohenack.), n. 2300.
Harnieria dimorphocarpa, Solms in Schweinf. Flor. Æthiop. 110.

NOM. VERN. Khertom (B.C.S.).

Socotra. Near Tamarida. B.C.S. n. 417. Schweinf. n. 291.

DISTRIB. Scindh and Abyssinia.

A very remarkable species exhibiting a curious dimorphism in the fruit. This feature has been noticed in the plant, as its names indicate, from the date of its discovery, but it is one to which sufficient prominence has not

been given. Solms (*loc. cit.*) gives the fullest description of the fruit, but neither he nor Anderson take note of another feature, viz., the difference in the seeds contained in the two kinds of fruit. Briefly, the characters of the fruit are these:—In the same fascicles, without apparently any definite arrangement, two quite different forms of fruit are produced. One is the normally-shaped Acanthaceous capsule, such as belongs to other *Justiciæ*, and contains four seeds; but the other is a one-celled fruit with a softer wall, girt with a series of longitudinal wings, each of which has its margin produced into a number of hooked processes, and there is only one seed rising upon a small retinaculum from near the bottom of the fruit cavity. The seeds in the normally-shaped fruit are small and papillose tuberculate, whilst the single seed of the winged fruit is twice as large, hardly so much compressed, and is quite smooth or slightly fluted and warted. Apparently the one-celled fruit is indehiscent. Though I have devoted some time to the examination of our specimens, I have not been able to determine what, if any, difference exists in the flowers which respectively produce these two kinds of fruit. The winged and hooked fruits do not appear to be quite so numerous as the normal form, and afford additional means for seed dissemination, though what is the importance of the development in this species is at present difficult to explain.

Professor Oliver directs my attention to a case of dimorphism amongst Polygonaceæ, with, apparently, similar aim. In the south African *Oxygonum alatum*, Burch. (Trav. i. 548; Benth. in Hook. Ic. Pl. t. 1321), also a plant of dry regions, the perianth around some fruits is greatly developed forming broad expanded wings, in others these wings are hardly visible, and reduced to a series of mere tubercles.

2. J. (Gendarussa) **rigida**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 87. Tab. LXXII.

Fruticosa rigida lignosa cano-velutina; foliis minutis obovatis v. oblanceolatis; floribus spicatis axillaribus; bracteolis minutis calyce brevioribus; capsula cana strigulosa.

Frutex lignosus nanus incanus cortice corrugato ramis ad extremitates defoliantibus marcescentibus proventuque subspinescentibus ramulos laterales numerosos contractos gerentibus. *Folia* sessilia v. subsessilia ad ramos elongatos opposita ad contractos fasciculata, lineari-obovata v. oblanceolata obtusa sæpe emarginata integra $\frac{1}{4}$–$\frac{1}{3}$ poll. longa (rarius $\frac{1}{2}$ poll.) $\frac{1}{12}$–$\frac{1}{8}$ poll. lata crassa cano-tomentosa v. velutina. *Flores* subsessiles in racemos v. spicas breves $\frac{2}{3}$–1 poll. longos 3–6-floros anfractuosos axillares dispositi rhachi angulata cano-pubescente ad nodos bracteis 2 oppositis subovatis minutis pubescentibus instructa. *Bracteolæ* subulatæ $\frac{1}{12}$ poll. longæ pubero-canæ. *Calyx* alte 5-fidus, segmentis lineari-lanceolatis $\frac{1}{8}$ poll. longis subæqualibus extus velutino-pubescentibus. *Corolla* $\frac{1}{4}$ poll. longa extus strigulosopubescens ad medium 2-labiata, labio antico trifido segmentis obtusis medio majore postico ovato-acuto erecto, tubo inferne tenui extusque glabro sursum parvus ampliato. *Stamina* 2 infra medium tubum affixa, filamentis basi incrassatis pilosiusculis cum pulvinis villosis interpositis; antherarum loculus inferus longe calcaratus inflexus. *Discus* cupulæformis dentatus. *Stylus* validus basi pilosiusculus apice 2-dentatus. *Capsula* $\frac{1}{3}$ poll. longa 4-

sperma striguloso-cana, stipite $\frac{1}{8}$ poll. longo. *Semina* glabra $\frac{1}{12}$ poll. diam. scabrido-tuberculata.

Socotra. On the plains. B.C.S. n. 358.

Distrib. Endemic.

Another characteristic, hoary and woody, intricately-branched plant of the plains, and belonging in this genus to the section *Gendarussa*, which includes shrubby plants with small spicate subsessile flowers and minute bracts and bracteoles. With species in this section its alliances are south African. *J. incana*, T. Anders. (in Journ. Linn. Soc. vii. (1864) 42), which is *Adhatoda incana*, Nees ab. Esenb. (in DC. Prod. xi. 393), is its nearest affinity. But though in habit and foliage almost identical, the plants are easily distinguished, as the south African one has large solitary flowers and large capsules.

8. TRICHOCALYX.

Trichocalyx, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 87.

Calyx alte 5-partitus, segmentis angustis linearibus acutis apice subulatis æqualibus. Corollæ tubus extus pubescens, intus glaber, limbo æquilongus, paulum incurvus, sursum ampliatus; limbus 2-labiatus, labio postico interiore erecto concaviusculo brevissime 2-lobato, antico oblongo patente breviter 3-lobato lobo medio extimo palato nullo. Stamina 2, fauci affixa, labio postico æquilonga, filamentis leviter arcuatis decurrentibus; antheræ 2-loculares, loculis discretis, altero altius affixo mucronato v. submutico, altero inferiore basi calcare brevi parvo albo appendiculato; staminodia 0. Discus cupularis v. pulvinatus, dentatus v. integer. Stylus filiformis, apice obtusus minute 2-lobatus; ovula in quoque loculo 2. Capsula oblonga, basi in stipitem solidum contracta. Semina 4 v. abortu pauciora, compressa, suborbiculata reniformia, papilloso-tuberculata, retinaculis obtusis complanatis fulta. —Frutices parvi. Folia integra, crassiuscula. Flores sordide purpurei, ad extremitates ramorum in cymas densas congesti. Bracteolæ calycis segmentis similes iisque parum breviores. Gibbi 2 pilosi ab extero basi corollæ tubum intrusi.

A genus of *Justicieæ* with two-celled anthers, the lobes of which are slightly unequal and discrete, the upper one being sometimes almost muticous, but is commonly mucronate, whilst the lower, which is always spurred, has at times the spur much reduced. Its other prominent features are the thread-like bracts, bracteole, and calyx-segments, which both in flower and fruit radiate from the clustered inflorescence, and the form of the corolla.

The genus has some resemblances with members of the group to which *Ballochia* belongs, but the antherine characters exclude it, and relegate it to the vicinity of *Justicia* itself. With some shrubby members of this genus it agrees in habit, but the mucronate upper anther-lobe, and the absence of all palate on the corolla, as well as the general form of this latter, are diagnostic. From *Adhatoda*, so nearly allied to *Justicia*, similar characters separate it, and whilst its habit is that of *Anisotes*, presently to be referred to, it wants the long anterior corolline lip of that genus, and has quite a different inflorescence. *Isoglossa* is

another genus of this Justicioid group which claims an affinity, but, amongst other points, habit distinguishes it.

There are two species found in Socotra, one being very abundant.

ETYM. Θρὶξ, a hair, and κάλυξ.

1. T. obovatus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 88. Tab. LXXIII, A.

Ramulis glaucis lepidotis pilisque brevibus puberulis; foliis anguste obovatis v. oblongo obovatis.

8-10-pedalis ramulis sulcatis tenuibus glaucis lepidotis pilisque brevissimis puberulis, internodiis elongatis sæpe 1½ poll. longis. *Folia* petiolata anguste obovata v. oblongo-obovata rarius late sublanceolata v. elliptica ¾–1¼ poll. longa ½–⅝ poll. lata obtusa sæpe subtruncata et emarginata v. rarius late acuta basi in petiolum glaucum puberulum ⅙–⅕ poll. (interdum ⅓ poll.) longum gradatim attenuata crassiuscula glabra siccitate papillosa. *Flores* in cymis brevissime pedicellata; bracteæ lanceolato-acutæ. *Bracteolæ* ¼ poll. longæ. *Calycis* segmenta 1/12 poll. longa glandulis stipitatis capitatis vestita leviterque pubescentia. *Corolla* 1⅙ poll. longa. *Stylus* puberulus pollicaris. *Capsula* glandulis vestita, matura non visa.

NOM VERN. Elhal (B.C.S.). Hunter.

Socotra. Common on the hills. B.C.S. nn. 428, 541, 597. Schweinf. n. 371.

DISTRIB. Endemic.

A pretty flowered plant. The inflorescences are very characteristic. The leaves on adventitious twigs and young plants are often much reduced in size, and the laminæ assume a somewhat orbicular shape at the end of long petioles. Our n. 597 is such a form.

Messrs Haage and Schmidt send me a twig of a plant they have raised from seed brought home by Schweinfurth. It is this species.

T. orbiculatus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 88. Tab. LXXIII, B.

Ramulis tomentoso-pubescentibus; foliis orbiculatis.

Arbor parva v. frutex elatus ramulis validis pubescente-tomentosis sulcatis, internodiis brevibus plerumque ¼–⅕ poll. longis ramulos axillares breves foliosos gerentibus. *Folia* breviter petiolata orbiculata sæpe latitudine longitudinem excedente ½–⅔ poll. diam. apice interdum retusa crassa glauca glanduloso-lepidota siccitate papillosa, petiolo 1/12–⅛ poll. longo. *Flores* in cymis subcapitatis brevissime pedicellati; bracteæ lanceolatæ acutæ bracteolis latiores. *Bracteolæ* segmentis calycis angustiores ⅙ poll. longæ. *Calycis* segmenta ½ poll. longa pubescentia glandulis capitatis stipitatis paucis vestita. *Corolla* atro-purpurea ⅝ poll. longa. *Stylus* puberulus exsertus. *Capsula* ½ poll. longa pubescens.

Socotra. On the hills south-west of Galonsir. B.C.S. n. 175.

DISTRIB. Endemic.

Another pretty shrub of this genus with dark purple flowers and shortly-stalked approximated leaves, by which character and their shape it is readily distinguished from the foregoing.

9. ANISOTES.

Anisotes, Nees ab. Esenb. in DC. Prod. xi. 424; Benth. et Hook. Gen. Pl. ii. 1111.

A genus of two species of shrubs, one a native of Arabia, the other peculiar to Socotra. The plant described by Forskål (Fl. Ægypt. Arab. 7) as *Dianthera trisulca* (*Justicia trisulca*, Vahl Symb. ii. 10), is the type of this genus, founded by Nees and kept up by Bentham and Hooker, although it is very closely allied to *Adhatoda*, on account of the long narrow anterior lip of the corolla. Our plant adds a second species to this hitherto monotypic genus, and our specimens enable us to complete the description of the genus, which has hitherto been deficient in fruit and seed characters; these are,—

Capsula oblonga basi in stipitem solidum loculis longiorem contracta. Semina 4 v. abortu pauciora suborbiculata plano-compressa, testa crassiuscula muricata, retinaculis obtusis fulta.

2. A. diversifolius, Balf. fil. in. Proc. Roy. Soc. Edin. xii. (1883), 88. Tab. LXXIV.

Fruticosus; foliis plus minusve obovatis; cymis axillaribus v. terminalibus.

Frutex glabrescens ramis cortice griseo ultimis striatis puberulis. *Folia* petiolata elliptica v. oblonga v. obovata haud raro obcordata v. subrotundata apice rotundata v. angustata obtusa sæpe retusa basi in petiolum attenuata v. subrotundata 1–1½ poll. longa ½–1 poll. lata v. minora integra vix revoluta glabra crassiuscula pennivenia papillis paucis siccitate notata, petiolo ¼–⅓ poll. longo striato puberulo. *Flores* in cymas axillares ¾–1 poll. longas dispositi, rhachi primaria stricta adscendente ⅓–½ poll. longa pubescente bracteas oppositas minutas ⅛ poll. longas ovatas glanduloso-pubescentes gerente; pedicelli brevissimi bibracteolati. *Bracteolæ* bracteis similes. *Calyx* ¼ poll. longus, segmentis lineari-lanceolatis extus glanduloso-puberulis. *Corolla* flammeo-rubra 1½ poll. longa, tubo angusto cylindrico extus piloso-pubescente, limbo longissime 2-labiato, labio postico erecto subconcavo antico æquilongo apice brevissime 2-lobato lobis reflexis, antico ⅝ poll. longo apice breviter 3-lobato lobis obtusis subæqualibus plerumque reflexis. *Stamina* corollæ æquilonga, filamentis complanatis venulo medio prominulo marginibusque membranaceis ad corollinem orem affixis et decurrentibus; antherarum loculi æquales ⅕ poll. longi disjuncti basi acuti. *Ovarium* glabrum basi disco magno crasso angulato cinctum; stylus filiformis staminibus æquilongus puberulus apice incurvus et obscure 2-lobatus. *Capsula* ⅔ poll. longa ⅙ poll. diam. oblonga punctata loculis angustis glabra superne vix puberula, stipite ⅚ poll. longo. *Semina* retinaculis pubescentibus fulta.

Nom. Vern. Elhan.

Socotra. On the hills near Galonsir and Keregnigiti. B.C.S. nn. 506, 576. Schweinf. n. 477.

Distrib. Endemic.

A very interesting plant, for reasons stated above under the generic name. It may be readily distinguished from its congener *A. trisulcus*, Nees ab. Esenb. (*loc. cit.*), by its foliage.

We have another set of specimens which I think are to be considered of this species. The leaves are not, however, so markedly rounded at the apex but have a general tendency to narrow at the point, and the calyx is different,

the segments being very short, about one-twelfth of an inch long, and sometimes more or less deltoid; otherwise I cannot find characters to distinguish them. Very likely intermediate forms may be hereafter discovered, but meanwhile one may distinguish this as a variety,—

var. **brevicalyx**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Foliis apice angustatis; calycis lobis brevibus $\frac{1}{12}$ poll. longis.

Socotra. On Haghier. B.C.S. n. 479.

Distrib. Endemic.

10. RHINACANTHUS.

Rhinacanthus, Nees ab. Esenb. in Wall. Pl. As. Rar. iii. 76, and in DC. Prod. xi. 442; Benth. et Hook. Gen. Pl. ii. 1102.

A small old-world genus, including a few species dispersed in tropical Asia, tropical and south Africa, and in Madagascar.

R. scoparius, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883),88. Tab. LXXV.

Herba subglabra scoparia ramulis striatis; foliis longis linearibus.

Herba fere glabra subaphylla scoparia a collo axis subterranei lignosi multo et divaricatim ramosa, ramis internodiis elongatis sæpe 2–3 poll. longis in inflorescentiam excurrentibus tetragonis striatis ultimis subscabridulis. *Folia* mox decidua sessilia pauca linearia acuta $1\frac{1}{2}$–2 poll. longa $\frac{1}{12}$ poll. lata supra glabra subtus strigulosa. *Cymæ* spicatæ anfractuosæ sympodiales in axillis foliorum superiorum orientes et omnino inflorescentiam terminalem laxam ramosam formantes; pedunculi pedicellique breves scabriduli; bracteæ subulatæ minutæ. *Bracteolæ* 2 minutæ subulatæ pubescente-glandulosæ. *Calyx* $\frac{1}{5}$ poll. longus, segmentis breviter pubescentibus et glandulis capitatis stipitatis vestitis. *Corolla* alba $\frac{3}{4}$ poll. longa extus pubescens, tubo $\frac{5}{6}$ poll. longo intus minute puberulo, limbi lobis ellipticis obtusis. *Staminum* filamenta rigida complanata breviter pilosa; antherarum loculus inferior parum major dorsaliter obscure puberulus. *Ovarium* glabrum, loculis 2-ovulatis; stylus $\frac{1}{2}$ poll. longus puberulus apice breviter bifidus, lobis basi incrassatis. *Capsula* $\frac{7}{12}$ poll. longa pubescens, stipite $\frac{1}{4}$ poll. longo. *Semina* nigra glabra $\frac{1}{5}$ poll. diam.

Socotra. Near Tamarida and elsewhere. B.C.S. n. 687. Schweinf. nn. 448, 782 in lit., 783.

A new species of this small genus growing on the dry plains and well distinguished from all others by its Scoparioid habit and very narrow linear leaves.

11. ANCALANTHUS.

Ancalanthus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 88.

Calyx alte 5-partitus, segmentis lanceolatis acutis 3–5-nerviis subæqualibus. Corolla extus pubescens; tubus limbo brevior, incurvus, superne ampliatus, intus basi dense villosus; limbus longe 2-labiatus, labio postico exteriore ligulato truncato eroso recurvo apice spiraliter revoluto, antico subæquilongo recurvo patente lato elliptico-oblongo trifido lobis linearibus obtusis spiraliter revolutis intermedio latiore intimo. Stamina 2, fauci affixa, labio postico vix æquilonga, filamentis complanatis breviter decurrentibus; antheræ

oblongæ 2-loculares sagittatæ, loculis parallelis æqualibus muticis; staminodia 0. Discus inconspicuus. Ovarium glabrum; stylus filiformis exsertus apice breviter bilobatus; ovula in quoque loculo 2. Capsula ignota . . . . . .—Frutex. Folia subintegra. Flores flammeo-flavi in spicas longissimas terminales v. axillares dispositi. Bracteæ bracteolæque minutæ ovatæ. Alabastri falciformes.

A remarkable monotypic genus of which we have unfortunately incomplete specimens. It falls into the *Eujusticieæ* section of the tribe *Justicieæ*, amongst the genera with two-celled anthers having equal and muticous loculi. Its most prominent features are its habit, for it exhibits long straggling branches somewhat arcuate and striate with long internodes possessing a large pith contracted at the nodes, its long spicate inflorescence, and its curiously-bent corolla, with a long ligulate upper lip, external in æstivation, and a broad trifid lower lip.

In the set of genera with which it is associated there is no old world genus with which it has a close affinity. The tropical African *Himantochilus* is the nearest of them, but is readily distinguished by its inflorescence and corolla. Possibly its nearest ally is the Brasilian *Schaueria* which presents the same habit and striate stems with a large pith, and has also long somewhat similar spicate inflorescences; but it is readily separated by its calyx, corolla, bracts, and other characters.

ETYM. ἀγκαλὴ, the bent arm, and ἄνθος.

A. paucifolius, Balf. fil. *loc. cit.* Tab. LXXVI.

Suffrutex ramis elongatis subteretibus v. apud nodos obscure tetragonis leprosis glaucis, internodiis multo elongatis, nodis subconstrictis, in inflorescentiam excurrentibus. *Folia* petiolata opposita sparsa in speciminibus nostris 4 solum visa oblonga v. late lanceolata versus extremitates ambos angustata obtusa fere apiculata margine obscure crenato-repanda, maxima 2 poll. longa $\frac{2}{3}$ poll. lata et petiolo $\frac{1}{3}$ poll. longo. *Spicæ* sæpe pedales pauciramosæ rhachi breviter pubescente, floribus basalibus brevissime pedicellatis (pedicellis $\frac{1}{12}$ poll. longis) superioribus sessilibus; bracteæ ovatæ minutæ subcarinatæ inferiores sæpe cassæ. *Calyx* $\frac{1}{4}$ poll. longus extus pubescens pilisque glandulas capitatas gerentibus vestitis. *Corollæ* tubus $\frac{2}{3}$ poll. longus, limbi lobo postico $\frac{5}{6}$ poll. longo. *Antheræ* ad medium dorso affixæ $\frac{1}{6}$ poll. longæ. *Styli* lobi elliptici acuti.

Socotra. At the entrance of valley Ireh opening upon Nogad plain. B.C.S. n. 610.

This curious plant we only observed at this one spot on the south side of the island amongst large limestone boulders.

12. ECBOLIUM.

Ecbolium, Kurz in Journ. Asiat. Soc. Beng. xi. 2. (1871), 75, and xlii. 2. (1873), 99; Benth. et Hook. Gen. Pl. ii. 1118.

A genus of two species one of which is widely dispersed in tropical Asia and Africa, the other is endemic in Socotra.

E. striatum, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 89. Tab. LXXVII, A.

Fruticosum ramis striatis; foliis longe petiolatis plus minusve ovatis; bracteis integris pilosis viscidis; bracteolis calyce longioribus; corollæ limbo tubo subæquilongo calyceque duplo-longiore.

Frutex ramis glaucis striatis lepidotis. *Folia* petiolata ovata v. ovato-oblonga v. subelliptica v. ovato-lanceolata v. subrhomboidea 2–3 poll. longa $\frac{3}{4}$–1 poll. lata apice obtusa augustata basi cuneatim attenuata v. subrotundata obscure crenata coriacea glabra læto-viridia; petiolus $\frac{1}{2}$–1 poll. longus striatus. *Spicæ* tetragonæ 3 poll. longæ terminales v. in axillis supremis positæ pilis glanduloso-capitatis viscidæ rhachi pubescente, floribus approximatis solitariis v. 1–3-nis in axillis bractearum imbricatarum oppositarum obovatarum v. oblongo-ellipticarum v. obcuneatarum v. trapeziformium acutarum v. breviter acuminatarum $\frac{1}{2}$–$\frac{3}{4}$ poll. longarum $\frac{1}{4}$–$\frac{1}{3}$ poll. latarum integrarum venulosarum viscido-pilosarum. *Bracteolæ* lineari-lanceolatæ $\frac{2}{3}$ poll. longæ calyce longiores molliter et viscide pilosæ. *Calyx* alte 5-fidus $\frac{7}{12}$ poll. longus, segmentis lineari-lanceolatis apice filiformibus membranaceis nervis a basi ad apicem currentibus extus viscide pilosis. *Corolla* $1\frac{1}{5}$ poll. longa, tubo sursum ampliato $\frac{7}{12}$ poll. longo, labii antici lobis subæqualibus linearibus obtusis $\frac{1}{10}$ poll. latis, labio postico vix bilobato in medio $\frac{1}{6}$ poll. lato. *Staminum* filamenta pilosiuscula exserta; antheræ oblongæ basi sagittatæ $\frac{1}{10}$ poll. longæ. *Ovarium* 4-ovulatum apice pilosum; stylus 1 poll. longus basi pilosus. *Capsula* $\frac{2}{3}$ poll. longa pubescens $\frac{1}{4}$ poll. diam., stipite $\frac{1}{3}$ poll. longo. *Semina* orbiculata $\frac{2}{5}$ poll. diam. rugoso-muricata.

Nom. Vern. Kiléa (B.C.S.).

Socotra. On the Haghier hills at an elevation over 2000 feet. B.C.S. n. 504. Schweinf. n. 652.

Distrib. Endemic.

A new species of this, hitherto monotypic, genus. The other species *E. Linneanum,* Kurz (*loc. cit.*), is a well known and widely-spread type in tropical Africa, Arabia, and India, and passes through a vast number of forms, many of which have been described as species under the genus *Justicia.* From that genus, however, they are readily separated by the four-celled muticous anthers, and have been well associated by Kurz in his genus *Ecbolium.* The extensive synonymy is given by T. Anderson (in Journ. Linn. Soc. vii. (1864), 116) under the Linnean name *Justicia Ecbolium.*

In habit and some technical characters our plant is very like the type, but differs from all the forms of this in, firstly, the longly-petiolate leaves. In *E. Linneanum,* the leaves of almost all the forms are very shortly stalked, or are subsessile, and in the petiolate forms the stalk never reaches nearly the length it attains in our specimens. But secondly, and more markedly, our plant differs in the corolla; for it wants the long narrow tube of *E. Linneanum,* and the broad segments of the lower lip. The whole corolla is indeed much shorter, has a relatively wider and much shorter tube, with which the limb is nearly equal, and the segments of the anterior lip are narrow, linear, and subequal, and equal in length to the slightly wider shortly-bilobed posterior lip. Again, the bracts in our

specimens are entire, uniformly hairy, with gland-tipped hairs, whilst Kurz's type plant has toothed bracts, often quite glabrous and not viscid.

The Socotran species, it would appear, has also a tendency to variation. We have another set of specimens from the island, representative of a more common plant than the one I have just referred to, which are merely miniatures of it. Reduce all the parts of the species as I have described it except the spikes by about one-half, and you have this second form. This may be regarded as a distinct variety, of which the following is a diagnosis :—

var. **minor**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 89. Tab. LXXVII, B.

Fruticosum minus; foliis minoribus late ovatis v. oblongis basi rotundatis sæpe subcordatis longe petiolatis, petiolo sæpe 1 poll. longo lamina longiore; spicis multo elongatis 4½–5 poll. longis internodiis longioribus, floribus bracteisque adpressis sed non-imbricatis, bracteis oblongo-acutis ⅔ poll. longis $\frac{1}{12}$ poll. latis; bracteolis lanceolatis ¼ poll. longis calyce breviоribus; calyce ⅓ poll longo; corolla ⅔ poll. longa, lobis anticis ⅔ poll. longis $\frac{1}{12}$ poll. latis; antheris $\frac{1}{12}$ poll. longis; stylo ½ poll. longo; capsula ⅓ poll. longa.

Socotra. Common. B.C.S. nn. 433, 462.

The features, in addition to the smaller size, in which this variety differs from the type are, the very long and narrow spike with internodes considerably elongated, and the flowers and bracts not at all or less closely imbricated, whilst the bracteoles are shorter than the calyx.

13. DICLIPTERA.

Dicliptera, Juss. in Ann. Mus. Par. ix. (1801), 267; Benth. et Hook. Gen. Pl. ii. 1120.

A considerable genus dispersed widely in the tropical and subtropical regions of the whole world. Both the Socotran species are endemic.

D. effusa, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 89.

Annua diffusa ramosissima subglabra nitida; foliis ovatis longe petiolatis pungente-cuspidatis dichasiis longe pedunculatis solitariis axillaribus; bracteolis viscidis lanceolatis v. oblanceolatis pungentibus; corolla bracteolis breviter longiore; capsula viscida.

Sequipedalis glabrescens radice elongato a collo effuse multiramosa ramis patentibus internodiis elongatis ad nodos sæpe anfractuosis tetraquetris in inflorescentiam gradatim excurrentibus, juvenilibus subcanescentibus. *Folia* petiolata ovata, inferiora latiora, superiora angustiora, radicalia maxima, lamina 1 poll. longa ¾ poll. lata petioloque 1 poll. longo, sursum gradatim minora acuta sæpe pungente-cuspidata v. obtusa basi rotundata v. subcordata v. late cuneata haud raro inæqualia margine integra v. obscure lateque crenata, seniora plus minusve pilosa ciliata, juniora substrigulosa v. subtus glauco-subvelutina tenuia. *Flores* in dichasia solitaria axillaria dispositi rhachi tetraquetra 1–1½ poll. longa stricta adscendente subvelutina; bracteæ duæ setiformes ⅛ poll. longæ; pedicelli primum villosi v. pubescentes, terminali ¼–½ poll. longo, laterali ⅖ poll. longo, haud raro bracteolis 2 subulatis minutis supra v. infra medium instructi. *Bracteolæ* subflorales 4 florem unum plerumque includentes, 2 exteriores inæquales minore $\frac{3}{10}$ poll. longa lanceolata v. oblanceolata versus extremitatem utremque attenuata submembranacea

pungente-cuspidata glanduloso-puberula trinervia medio nervo perspicuo, majore ¼ poll. longa majus foliacea nervo medio prominentiore venulisque superne conspicue reticulatis cæteroquin minori simili, 2 interiores æquales ¼ poll. longæ calyce longiores lanceolato-acuminatæ membranaceæ nervo medio prominulo breviter puberulæ subciliatæ. *Calyx* ⅙ poll. longus, segmentis subæqualibus lanceolato-acerosis pubescentibus glandulosis ciliatis. *Corolla* ½ poll. longa purpurea, tubo ¼ poll. longo extus superne pilosiusculo, limbo postico ovato v. subelliptico ⅙ poll. lato obtuso, antico late lineari $\frac{1}{12}$ poll. lato apice brevissime trilobato postico sublongiore. *Stamina* limbo postico æquilonga; antheræ disjunctæ subrotundatæ. *Ovarium* glabrum 4-ovulatum; stylus apice bidentatus. *Capsula* ⅙ poll. longa viscida pilis glandulas capitatas gerentibus, stipite brevissimo. *Semina* plano-convexa tuberculata v. submuricata.

Socotra. Very common. B.S.C. nn. 117, 566. Schweinf. n. 463.

Distrib. Endemic.

Quite a distinct form amongst the non-capitate species of the genus. It is a rather prettily-flowered species.

2. D. ovata, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 89.

Annua parva pubescens prostrata; foliis ovatis breviter petiolatis; dichasiis breviter pedicellatis solitariis axillaribus; bracteolis sparsim viscidis: corolla bracteas longe excedente.

Herba parva pubescens pauciramosa ramis longis sæpe procumbentibus. *Folia* parva petiolata late ovata acuta $\frac{1}{12}$ poll. longa ⅖ poll. lata v. minora basi subcordata v. truncata rarius late cuneata pubescentia siccitate nigricantia, petiolo ¼ poll. longo. *Flores* in dichasia simplicia dispositi in axillis superioribus breviter pedunculata; pedunculi ¼ poll. longi stricti; bracteæ subulatæ pubescentes ⅙ poll. longæ; pedicelli sæpe bibracteolati medio haud raro longiore $\frac{1}{12}$ poll. longo. *Involucrum* 4-bracteolatum florem unum includens, bracteolis inæqualibus, exterioribus latioribus oblanceolatis v. lanceolatis apiculatis submembranaceis trinerviis reticulato-venulosis intus vix pubescentibus extus venis pilis patentibus pubescentibus et intervallis strigosis cum glandulis stipitatis vestitis majore ⅖ poll. longa minore $\frac{3}{10}$ poll. longa, interioribus exterioribus subæquilongis v. longioribus oblanceolatis v. linearibus ad extremitates ambos attenuatis margine membranaceis medio nervo conspicuo more exteriorum vestitis. *Calyx* ⅙ poll. longus alte 5-fidus intus strigosus extus pubescens, laciniis lanceolatis ciliatis. *Corolla* ¾ poll. longa purpurea resupinata extus pubescens, tubo ¼ poll. longo limbo breviore abrupte reflexo intus pubescente, limbo postico late ovato v. subrotundato ¼ poll. lato, antico oblongo breviter 3-lobato. *Stamina* limbo corollæ breviora, filamentis antice pilosis; antheræ muticæ. *Disci* lobi ovati vix cuspidati. *Ovarium* glabrum; stylus bifidus corolla longior. *Capsula* ignota.

Socotra. Near Tamarida on the hill slopes. B.C.S. n. 577.

Distrib. Endemic.

A species easily distinguished from the preceding one by its somewhat creeping, scarcely-branched habit, its dense pubescence, more shortly-stalked leaves, flowers on stouter peduncles, and the smaller bracteoles enclosing flowers the corolla of which is fully one-half larger. The form and arrangement of the bracteoles allow of little doubt as to its correct position in this genus.

Peristrophe, into which it might almost go, has rarely such broad bracteoles. Unfortunately we have no fruit to confirm the determination.

14. PERISTROPHE.

Peristrophe, Nees ab Esenb. in Wall. Pl. As. Rar. iii. 112, and in DC. Prod. xi. 492 ; Benth. et Hook. Gen. Pl. ii. 1121.

A genus of wide range through tropical Asia and tropical and south Africa, extending also to Madagascar.

P. bicalyculata, Nees ab. Esenb. in Wall. Pl. As. Rar. iii. 113, and in DC. Prod. xi. 496; Ach. Rich. Tent. Flor. Abyss. ii. 160; T. Anders. in Journ. Linn. Soc. vii. (1864), 47, and ix. (1867), 521.

P. Schimperiana, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1095.
P. Kotschyana, Nees ab. Esenb. in DC. Prod. xi. 497 ; Ach. Rich. Tent. Flor. Abyss. ii. 160.
Justicia ligulata, Lamk. Illustr. i. 42, t. 12, f. 2.

And many other synonyms, for which see authorities quoted.

Socotra. A common weed. B.C.S. n. 46. Schweinf. nn. 246 in lit., 784.

Distrib. From Cape de Verde Islands, through tropical Africa and Arabia to India.

The Abyssinian specimens described as *P. Kotschyana,* are less hairy than is typical.

15. HYPOESTES.

Hypoestes, R. Br. Prod. 474; Benth. et Hook. Gen. Pl. ii. 1122.

A considerable old world tropical and subtropical genus. One of the Socotran species is a tropical and south African and Arabian one, the other is endemic.

1. H. verticillaris, R. Br. Prod. 474; Nees ab. Esenb. in DC. Prod. xi. 507; T. Anders. in Journ. Linn. Soc. vii. (1867), 48.

H. Forskalei, R. Br. *loc. cit.*; Nees *loc. cit.*; Ach. Rich Tent. Flor. Abyss. ii. 163.
H. Forskalei, var. *canescens,* Franch. Sert. Somal. in Miss. Révoil 54.
H. clinopodia, Nees ab. Esenb. in DC. Prod. xi. 508.
H. polymorpha, E. Meyer Cat. Pl. Afr. Austr. Drège.
H. mollis, T. Anders. *loc. cit.* 49.
H. Rothii, T. Anders. *loc. cit.* 49.
Justicia verticillaris, Linn. Suppl. 85.
J. clinopodia, E. Meyer Cat. Pl. Afr. Austr. Drège.

Socotra. Very common. B.C.S. nn. 118, 514. Schweinf. nn. 222 in lit., 368.

Distrib. Tropical Africa, Cape, and Arabia.

A species showing considerable variation, both in form of leaf and in indumentum. Nees, in the Prodromus, distinguishes two varieties, and if we add another

we obtain three groups into which, it appears to me, the forms of the species naturally fall. They are the following:—

a. tota holosericeo pubescens.

This includes *H. polymorpha*, E. Meyer, and is the common Cape form. It has also been found in Zambesi land.

b. **denudata**, Nees.

Minor glabra v. subglabra; foliis plus minusve lanceolatis ad extremitates utrosque attenuatis; spicis floribus paucioribus; calyce longiore; disci lobis ovarium excedentibus.

Includes *H. Forskalei*, R. Br. and *H. Rothii*, T. Anders.

This form occurs in south Africa, and is the Abyssinian and Arabian type of the species. It is noticeable that the calyx nearly equals the involucre-bracteoles, and that the lobes of the disk, especially in Abyssinian plants, much exceed the ovary.

c. **mollis**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Molliter velutina v. velutino-pubescens albida; foliis longius petiolatis plus minusve ellipticis v. late ovatis basi late cuneatis; spicis densis pilis longis hirtis; calyce minore.

Includes *H. mollis*, T. Anders., probably *H. Forskalei*, var. *canescens*, Franch., and probably *H. clinopodia*, Nees. This latter I have not seen, but the description indicates its position in this species.

This is the third variety and the one we constitute. It embraces the form from Angola and east tropical Africa, probably also a Cape form, and our Socotran plant. The Socotran specimens are more velvety than the African, which are rather velvety-pubescent.

Our specimens, n. 514, approach somewhat the type *a*.

2. **H. pubescens**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 89.

Annua parva pubescens; foliis petiolatis ovatis; cymis paucifloris terminalibus v. axillaribus; bracteolis involucri 4 inæqualibus calyce longioribus exterioribus majoribus; corolla resupinata, labio postico longe mucronato; capsula pubescente.

Pedalis v. semipedalis pubescens. *Folia* breviter petiolata ovata v. elliptica v. elliptico-ovata $\frac{1}{2}$–1 poll. longa $\frac{1}{3}$–$\frac{1}{2}$ poll. lata acuta v. obtusa apice sæpius rotundata basi parum angustata integra dense pubescentia subtus pallidiora, petiolo $\frac{1}{8}$–$\frac{1}{5}$ poll. longo. *Gemmæ* villosæ. *Flores* sæpe in axillis solitarii v. in cymas spicatas breves paucifloras terminales v. axillares dispositi; bracteæ subspathulatæ v. anguste obovatæ $\frac{1}{6}$ poll. longæ. *Involucrum* florem unum includens, bracteolis exterioribus $\frac{1}{3}$ poll. longis majoribus glanduloso-pubescentibus ad medium connatis parte libera lineari-obtusa, interioribus $\frac{1}{4}$ poll. longis angustioribus oblanceolatis acutissimis lateraliter membranaceis nervo medio prominulo. *Calyx* $\frac{1}{5}$ poll. longus membranaceus intus strigulosus extus puberulus per partem trientem 5-fidus, laciniis longe acutis. *Corolla* resupinata $\frac{2}{3}$–$\frac{3}{4}$ poll. longa dilute rosea v. alba, tubo $\frac{1}{2}$ poll. longo intus glabro extus piloso-puberulo ab medio abrupte reflexo, labio postico obcuneato eroso dentato emarginato cum mucrone longo sub anthesin recurvato, antico postico longiore breviter trilobato lobis obtusis. *Stamina* limbo corollæ subæqualia v. longiora, filamentis

antice hirtis; antherarum loculi obovoidei. *Disci* lobi ovati cuspide lineari ovarium non excedente terminati. *Ovarium* glabrum; stylus fere integer. *Capsula* $\frac{1}{4}$ poll. longa pubescens, stipite glabro $\frac{1}{8}$ poll. longo. *Semina* glabra pannosa.

Socotra. On the Haghier hills at a considerable elevation. B.C.S. n. 509. Schweinf. n. 612.

A small and very distinct species.

Order LV. SELAGINEÆ.

A small family of nine genera of herbaceous or shrubby plants, chiefly of old world extra-tropical distribution, having their headquarters in south Africa, but some occur in tropical Africa, Europe, and Asia. Represented in Socotra by one endemic genus.

COCKBURNIA.

Cockburnia, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 90.

Calyx 5-fidus, tubulosus, lobis angustis acutis æqualibus. Corollæ tubus brevis, superne ampliatus; limbus 2-labiatus, patens, labio postico 2-lobato, antico parum longiore 3-lobato lobis subæqualibus. Stamina 4, didynama, supra medium tubum affixa, exserta; antheræ versatiles, confluentes uniloculares, medio vix constrictæ. Ovarium 1-loculare, 1-ovulatum; stylus apice minute bilobatus. Fruct. ignot.—Frutex incanus, ramis diffusis, virgatus. Folia alterna, obovata, integerrima. Flores cæsii, parvuli, in spicas breves terminales sæpe compositas dense conferti, singuli in axilla bracteæ sessiles, ebracteolati. Bracteæ non involucratæ, auguste lanceolatæ, calyce parum breviores, cum calyce hirtæ.

An interesting monotypic genus of this small family, distinguished from all other genera except *Globularia* by its one-celled ovary.

With this latter genus it has its nearest alliance in the order, and forms a second member of the section which has hitherto embraced *Globularia* alone. From *Globularia* itself it is excluded by many characters. Notably there is a difference in habit and in the fibrous texture of our plants; then the flowers are arranged in spikes to which there are no involucrate bracts. The corolla is unlike the corolla of the majority of species of *Globularia*, being bilabiate with a short tube and short limb, there are, however, sometimes corollas in *Globularia* approaching it in form. Lastly, the anthers are hardly so constricted as in *Globularia*, though there is a distinct grooving of the surface.

Etym. After Lieut. J. G. Cockburn, 6th Royal Regiment, a member of our expedition.

C. socotrana, Balf. fil. *loc. cit.* Tab. LXXVIII.

Ramis elongatis pendulis cortice fibroso; foliis 1–1½ poll. longis $\frac{1}{3}$–$\frac{5}{12}$ poll. latis obtusis retusis v. apiculatis basi in petiolum brevem gradatim attenuatis, supremis sæpe subsessilibus, margine revolutis subtus pallidioribus breviterque velutino-pubescentibus supra puberulis subtrinerviis venulis a basi versus apicem curvantibus; spicis sæpe 2 poll. longis; bracteis $\frac{1}{8}$ poll. longis; calyce $\frac{1}{6}$ poll. longo ad medium trifido; corollæ tubo $\frac{1}{6}$ poll. longo extus

intusque puberulo panno atro antice colorato, limbi lobis late rotundatis obscure denticulatis; styli lobis complanatis.

Socotra. Common on the hills, at elevations above 1000 feet. B.C.S. nn. 262, 317, 558. Schweinf. nn. 568, 610.

Distrib. Endemic.

From some localities specimens of this plant show much smaller and narrower leaves, with less hairy clothing and therefore more vividly green. The branches, too, are shorter, somewhat erect, and at the same time the spike of flowers becomes greatly reduced in size, assuming a deltoid subcapitate form. Of this character are our specimens, n. 558, and Schweinfurth's, n. 568.

Order LVI. VERBENACEÆ.

A large order of the warmer regions of the world. Many species occur in extratropical regions of the southern hemisphere, but few in these regions of the northern hemisphere. Five genera are represented in Socotra. One of these is endemic, one is widely dispersed in the old world, though also occurring in America, whilst a third is chiefly American, with a few African representatives, and some world-wide weeds. The other two are cosmopolitan in the tropics.

1. LIPPIA.

Lippia, Linn. Gen. n. 781; Benth. et Hook. Gen. Pl. ii. 1142.

A considerable genus of chiefly American herbs or shrubs, but a few are African and two are common tropical weeds.

L. nodiflora, Michx. Flor. Bor. Amer. ii. 15; Schauer in DC. Prod. xi. 585; Ach. Rich. Tent. Flor. Abyss. ii. 168; Boiss. Flor. Orient. iv. 532; Wight Ic. t. 1463.

Verbena nodiflora, Linn. Sp. 28.
V. capitata, Forsk. Fl. Ægypt. Arab. 10.
Zapania nodiflora, Lamk. Illustr. i. 60, t. 17, f. 3.

And many other synonyms.

Socotra. In marshes, abundant. B.C.S. n. 10.

Distrib. Cosmopolitan in the tropics.

2. PRIVA.

Priva, Adans. Fam. ii. 505; Benth. et Hook. Gen. Pl. ii. 1145.

A small genus of nine species of herbs, widely dispersed in the warmer regions of the world.

P. leptostachya, Juss. in Ann. Mus. Par. vii. (1806), 70; Schauer in DC. Prod. xi. 533.

P. dentata, Juss. *loc. cit.*; Schauer *loc. cit.*; Ach. Rich. Tent. Flor. Abyss. ii. 165.
P. Forskaolii, E. Meyer Comment. Pl. Afr. Austr. 275; Jaub. et Spach, Ill. Pl. Or. v. t. 455.

P. abyssinica, Jaub. et Spach *loc. cit.* tt. 453, 454; Boiss. Flor. Orient. iv. 533; Franch. Sert. Somal. in Miss. Révoil 50.

Streptium asperum, Roxb. Pl. Corom. ii. 25, t. 146; Wight in Hook. Journ. Bot. i. (1834), 230, t. 130.

Socotra. On the hill slopes. B.C.S. n. 542.

Distrib. Indian Peninsula, tropical Africa, Cape of Good Hope.

A species varying considerably in the sculpturing of its fruit, and its forms have consequently been described as distinct species.

Abyssinian specimens show a dorsal armature of four rows, arranged in pairs, of long hooked spines radiating from the fruit, and separated mesially by a shallow transversely striated groove. Laterally there is no armature, but a few striæ run ribwise to the commissure. The fruit is distinctly puberulous, often fuscous. This is the type of *P. abyssinica*.

Cape specimens show but two rows of hooked spines which project at right angles to the side of the fruit, and are usually somewhat shorter. The back of the fruit has a mesial groove with transverse bars passing from it, and has a more regular surface than in the last. The sides are faintly ribbed. The fruit is puberulous, usually whitish. This is the type of *P. dentata*.

Indian specimens show a general raised network spreading over the back of the fruit, from the angles of which uncinate spines arise and radiate in all directions, not falling distinctly into lines. The reticulation extends down on the side of the fruit to near the commissure. The fruits, too, are usually nearly glabrous and shining.

The Socotran plants show fruits very small, much smaller than in any other specimens I have examined, and the back of the fruit is tuberculate muricate or often only warted, rather than spiny. It is but faintly puberulous.

Although there are such differences, and some of them are beautifully figured by Jaubert and Spach *loc. cit.*, yet the forms so run one into the other it is impossible to make out specific differences.

3. CŒLOCARPUS.

Cœlocarpus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 90.

Calyx tubuloso-campanulatus, membranaceus, 6-costatus costis in mucrones productis, fructifer patens cupularis drupaque brevior. Corollæ tubus cylindraceus, æqualis; limbus patens, 5-fidus, lobis oblongis obovatis obtusis parum inæqualibus, 2 posticis minoribus. Stamina 4, didynama, supra medium tubum affixa, inclusa, filamentis brevibus; antheræ cordiformes, inappendiculatæ, loculis divergentibus. Ovarium integrum, 4-loculare, loculis 1-ovulatis; stylus inclusus apice brevissime bifidus, lobo antico majore stigmatoso, postico erecto levi. Drupa succosa calyci patenti imposita, endocarpio osseo, pyrenis 2 bilocularibus lacuna intermedia separatis. Semina exalbuminosa.—Frutex pubescens, inermis. Folia opposita elliptica, crenata, venulis subtus prominentibus. Racemi terminales, breves. Flores parvuli in axillis bractearum minutarum breviter pedicellati, ebracteolati, secus rhachin alterni v. subopposite approximati.

A monotypic genus undoubtedly referable to the tribe *Verbeneæ*, and decidedly Lantanoid in habit. But, from the genus *Lantana* and its allies the 4-celled ovary and the fruit separate it, and its closest affinity appears to be with the tropical and subtropical American genus *Citharexylum*, the species of which, twenty in number, are spread from Brazil and Bolivia to Mexico.

The technical characters by which it is separated from its American ally are found in the androecium. In *Citharexylum* the connective is enlarged behind the anther, forming a sort of cushion upon which the parallel lobes lie, and this cushion often forms a small apical antherine appendage. In the Socotran plant the anthers are minute, divergent at the base, without an enlarged connective. In other characters the genera agree well,—in inflorescence, calyx, corolla, ovary, and most remarkably in the fruit, which is somewhat peculiar, having in the centre between the two-celled pyrenes a cavity larger than the loculi. This has given the name to our genus. In habit there is a slight difference. Species of *Citharexylum* are commonly shining, somewhat glabrous, plants, frequently spiny. Ours is an unarmed pubescent shrub. But there are species of *Citharexylum* which are tomentose.

Altogether the affinity of the Socotran and the American plant is very close, so close indeed that, apart from their distribution, one would probably have been inclined to regard the Socotran plant as a *Citharexylum*. But the antipodean distribution makes the union at present less advisable, when there are such differences in the staminal whorl.

Whether congeneric or not the affinity is clear, and is interesting from the point of view of geographical distribution, as it adds another to those instances of species endemic in the Indian Ocean islands which find their nearest allies in new world or almost antipodean forms of either the same or closely related genera. Perhaps a more special interest attaches to this Socotran plant inasmuch as in another genus, *Nesogenes*, of this order, we witness such features of distribution; the endemic Rodriguez species *N. decumbens*, Balf. fil. (in Trans. Roy. Soc. 168 extra vol. 362), having its only congener *N. euphrasioides*, Alph. DC. (Prod. xi. 703), a native of the Polynesian islands. I have elsewhere alluded to these antipodean affinities, but may here mention as other examples our Socotran Geraniaceous monotypic *Dirachma*, with its American allies *Wendtia* and *Viviania*; the monotypic Turneraceous *Mathurina* of Rodriguez, whose nearest ally is the monotypic *Erblichia* of Central America; the American *Thamnosma* (Rutaceæ), with one Socotran and two north American species; the small Sapotaceous genus *Labourdonnaisia*, with four peculiar Mascarene species, one endemic in Natal and a sixth in Cuba; and the large Laurineous *Ocotea*, a genus exclusively tropical and subtropical American, but for three old world species, one of them occurring in the Canary Islands, one in south Africa, and one in Madagascar.

ETYM. κοῖλον, a hollow, and καρπὸς.

C. socotranus, Balf. fil. *loc. cit.* Tab. LXXIX.

Lignosus 3-4-pedalis cortice albo ramis ultimis brevibus puberulis; foliis 1–2 poll. longis $\frac{1}{2}$-$\frac{3}{4}$ poll. latis ellipticis v. oblongis v. subtrapeziformibus v. obovatis basi cuneatis petiolatis margine crenatis v. subserrulato-crenatis supra strigosis infra pubescentibus, petiolo $\frac{1}{6}$-$\frac{1}{4}$ poll. longo; spicis $\frac{3}{4}$-1 poll. longis; bracteis subulatis, pedicellis $\frac{1}{12}$ poll. longis parum longioribus; calyce $\frac{1}{6}$ poll. longo extus glanduloso costis strigosis intus sericeo-villoso; corollæ tubo calyci æquali extus glabro, limbo plerumque revoluto striguloso piloso; drupa ovoidea $\frac{1}{4}$ poll longa.

Socotra. On the slopes of the hills at an elevation over 1000 feet. Not at all an uncommon shrub. B.C.S. nn. 299, 520.

DISTRIB. Endemic.

4. CLERODENDRON.

Clerodendron, Linn. Gen. n. 789; Benth. et Hook. Gen. Pl. ii. 1155.

A considerable genus of herbs, shrubs, or trees, widely spread in the warmer regions of the old world. Few occur in the new world. Both Socotran species are endemic.

1. C. galeatum, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 91. Tab. LXXX.

Fruticosum fusco-tomentosum; foliis petiolatis ellipticis v. subobovatis; cymis strictis termin alibus; bracteis magnis foliaceis; corollæ lobo postico cucullato.

Frutex omnino pubescente-tomentosus fuscus ramis angulatis. *Folia* opposita petiolata 2–3½ poll. longa 1–2 poll. lata elliptica v. oblonga v. rarius subobovata obtusa v. late acuta rarius emarginata basi angustata margine obscure crenata late revoluta subtus densius pubescente-tomentosa pallidiora. *Inflorescentia* terminalis rigida erecta rhachi primaria regulariter racemose ramosa ramis adscendentibus ex axillis bractearum magnarum foliacearum sessilium subamplexicaulium ovatarum v. ellipticarum v. subrotundatarum orientibus et in parte basali stricta 1–2 poll. longa non floriferis sed apice semel v. bis dichasialiter ramosis bracteolisque spathulatis v. lanceolatis petiolatis suffultis; pedicelli $\frac{1}{4}$ poll. longi. *Calyx* $\frac{1}{6}$ poll. longus per partem trientem 5-lobatus, lobis rotundatis extus breviter pilosis. *Corolla* tubo $\frac{1}{4}$ poll. longo intus glabro, lobo postico cucullato-galeato $\frac{1}{2}$ poll. longo, cæteris subæqualibus ellipticis obtusis extus strigulosis ciliatis. *Stamina* fauci corollæ inserta, filamentis basi per $\frac{1}{8}$ poll. incrassatis rectis et villosis superne filiformibus strigulosis; antheræ oblongæ. *Drupa* 4-lobata, putamine crustaceo levi.

NOM VERN. Dnuha (B.C.S.).

Socotra. On the Haghier hills behind Tamarida. B.C.S. n. 441.

DISTRIB. Endemic

An interesting species having its nearest allies in *C. myricoides*, and *C pilosus*, Benth. and Hook. (Gen. Pl. ii. 1156), and a few other African species ranging from Abyssinia to the Cape, all characterised by the production of the posterior lobe of the corolla into a large helmet-like hood. Upon this character, Hochstetter (in Flora 1842, 225) founded the genus *Cyclonema*, but Bentham

and Hooker have reduced this to *Clerodendron*, as the hooding is more or less apparent in many other species of this genus.

The inflorescence of our species is a very marked feature with its large bracts, and this with the characters of the foliage easily separate it from related species.

2. **C. leucophlœum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 91.

Arboreum cortice albo, ramis tomentosis; foliis parvis oblongo-ellipticis; floribus solitariis axillaribus racemos longe pedunculatos formantibus; calyce sub fructu patente; fructu cernuo.

Arbor parva cortice albo ultime dichotome ramosa, ramis angulatis fulvo-tomentosis lateralibus sæpe contractis. *Folia* odora parva ⅔–1 poll. longa ⅓–½ poll. lata obovata v. oblongo-elliptica obtusa rarius emarginata basi in petiolum brevem attenuata margine integra vix revoluta supra glanduloso-puberula subtus pubescentia. *Flores* in axillis foliorum oppositorum supremum solitarii et racemos breves paucifloros bilaterales formantes longe pedunculati; pedunculi ¾–1 poll. longi pubescentes supra medium articulati et bibracteolati, bracteolis minutis. *Calyx* campanulatus sub fructu patens deltoide 5-dentatus puberulus. *Fructus* cernuus 4-lobatus parum succosus ¼ poll. diam., putamine tenui crustaceo. Cæt. ignot.

Socotra. A very common tree. B.C.S. nn. 182, 335.

Distrib. Endemic.

A strongly smelling species. Unfortunately our specimens are incomplete, wanting the flowers. But it appears to be a distinct species with some affinity to the foregoing, and I am inclined to place it in the set of *Cyclonema*; for the inflorescence is much reduced, as it frequently is amongst species with corollas such as occur in that set. In our plant the lateral branches are single flowered, and the peduncular bracteoles are empty.

In addition to the fruiting specimens I have taken as the type of this species, we have a number of leafy twigs collected at different localities from trees which are possibly identical with the one I have described. But there is no flower or fruit, and I shall refer to them here separately, leaving their definite determination to future exploration.

n. 265. Specimens showing long twigs with leaves somewhat larger than in the above type, and with a tendency to become glabrous. When dried quite inodorous. Otherwise like the type.

From the base of the limestone cliffs above Galonsir. Elevation over 1000 feet.

n. 385. Has longish twigs with large leaves, often as much as two and a half inches long by one inch broad, sometimes longly petiolate. When dry, faintly odorous. Otherwise like the type.

Nom. Vern. Seminha (B.C.S.).

From near the top of Sicante peaks of Haghier, at an elevation over 2000 feet.

n. 513. Is a stunted woody plant with many short contracted branches

bearing leaves but slightly larger than in the type, and also less prominently pubescent, having very short inconspicuous hairs. Quite inodorous. Otherwise like the type.

From the plains.

n. 580. Shows elongated twigs with large leaves, nearly as large as in n. 385, which are thin and membranous with longish petioles. Many of the lateral branchlets are contracted. Strongly odorous.

From the Haghier hills near Tamarida.

5. AVICENNIA.

Avicennia, Linn. Gen. app. n. 1237; Benth. et Hook. Gen. Pl. ii. 1160.

A genus of four species found on the shores of all countries in the warmer regions of the world.

A. officinalis, Linn. Sp. ed. 1. 110; Schauer in DC. Prod. xi. 700; Boiss. Flor. Orient. iv. 536; Ach. Rich. Tent. Flor. Abyss. ii. 173.

A. tomentosa, Jacq. Stirp. Amer. 178, t. 112, f. 2; R. Br. Prod. 518; Schauer in DC. Prod. xi. 699; Wall. Pl. As. Rar. iii. 44, t. 271; Wight Ic. t. 1481.

Socotra. At Khor Hadjin and elsewhere. B.C.S. n. 559.

Distrib. Of the genus.

The Socotran plant is the form with narrow lanceolate and acute leaves.

Order LVII. LABIATÆ.

A large family of, commonly odorous, herbs found in all parts of the globe. There are fifteen species in Socotra representing eight genera. Of these genera, three are widely spread round the world in the tropics, two of them also occurring in extratropical regions; four are essentially old world tropical genera, one of them being now found introduced in the new world, another extending to the Pacific islands, another to Australia, while the fourth has its maximum in the Mediterranean region; the eighth genus is one of limited range, occurring only in south Africa, Abyssinia, and Socotra.

1. OCIMUM.

Ocimum, Linn. Gen. n. 732, pro parte; Benth. et Hook. Gen. Pl. ii. 1171.

A large and widely-dispersed genus of odorous plants of the warmer regions of the globe.

O. canum, Sims Bot. Mag. t. 2452; Benth. Lab. 3, and in DC. Prod. xii. 32.

Socotra. Abundant everywhere. B.C.S. nn. 3, 435. Schweinf. n. 288.

Distrib. A variable plant of cultivation widely dispersed in tropical Asia, and Africa.

2. ORTHOSIPHON.

Orthosiphon, Benth. in Bot. Reg. sub. t. 1300; Benth. et Hook. Gen. Pl. ii. 1174.

A considerable genus of chiefly Indian and east Indian distribution, but a few species are tropical African, and one reaches Australia. Of the three Socotran species one is endemic, another is only known from Arabia, and the third is an Indian and south-west Asiatic species common at Aden.

1. O. tenuiflorus, Benth. in DC. Prod. xii. 50.

Socotra. Abundant. B.C.S. nn. 549, 578. Schweinf. nn. 392, 624, 731 in lit.

DISTRIB. Arabia.

2. O. pallidus, Royle; Benth. in Hook. Bot. Misc. iii. 370, and Lab. Suppl. 708, and in DC. Prod. xii. 50; Boiss. Flor. Orient. iv. 539.

Socotra. A common plant. B.C.S. n. 269.

DISTRIB. India and south-west Asia. Aden.

The Socotran plants are small and pubescent like the form from Aden.

3. O. ferrugineus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 91.

Suffruticosus tomentoso-pubescens demum glaber; foliis longe petiolatis late ovatis v. subcordiformibus rarius obovatis obtusis crenatis utrinque puberulis ferrugineis; racemis 6–8-floris glandulosis; corollæ tubo calyce triplo-longiore, fauce nuda; staminibus corolla brevioribus.

Suffrutex tripedalis ramulis striatis rigidis puberulis demum glabris fusco-nigris. *Folia* petiolata deltoidea ovata v. subcordiformia interdum elliptica v. obovata matura 1–1¼ poll. longa ⅝–¾ poll. lata apice plerumque angustata sæpe rotundata obtusa basi rotundata v. gradatim in petiolum attenuata margine crenato-undulata subrevoluta mollia utrinque velutino-subtomentosa et glandulis rufis vestita supra ferruginea subtus pallidiora juventute albida, petiolo ⅝–½ poll. longo. *Flores* in racemos 6–8-floros axillares 1' poll. longos decussatim ramosos dispositi; rhachis glabra pedicellique ¼ poll. longi glanduloso-puberuli; bracteolæ minutæ ovatæ sessiles pubescentes ciliatæ. *Calyx* intus glaber extus glandulis rubris capitatis vestitus ⅕ poll. longus fructifer auctus, tubo recto, limbi lobo postico late ovato acuto, lobis anticis 4 acuminatis. *Corolla* dilute rosea ½ poll. longa extus pubescens et glandulis capitatis vestita intus nuda, tubo recto, limbi lobis 4 posticis brevibus intermediis 2 majoribus. *Stamina* corolla breviora, filamentis puberulis. *Nuculæ* glabræ leves.

Socotra. Abundant on the Haghier hills. B.C.S. n. 420. Schweinf. n. 518.

DISTRIB. Endemic.

Apparently a distinct species remarkable in its shrubby habit and ferruginous soft foliage. Allied perhaps to *O. somalensis*, Vatke (in Linnæa xliii. (1880), 87), a plant of Somali Land collected by Hildebrandt.

3. PLECTRANTHUS.

Plectranthus, L'Her. Stirp. Nov. 85, tt. 41, 42; Benth. et Hook. Gen. Pl. ii. 1175.

A large old world tropical genus represented also in the Pacific islands.

Plectranthus sp.

Nom. Vern. Safāhra (B.C.S.).

Socotra. Abundant on the limestone plateaux above 1500 feet elevation. B.C.S. nn. 306, 645. Schweinf. n. 738.

A plant from Socotra may be a species of this genus. Schweinfurth sends specimens from plants grown by him at Cairo, and these he labels *Coleus sp.* But as we have no flowers nor fruit it is not possible to decide the point.

Amongst *Plectranthi*, its affinity is with forms like *P. Forskalei*, Vahl (Symb. i. 44). If it be a species of *Coleus*, then it will come near *C. arabicus*, Benth. (in herb. Mus. Par. and in DC. Prod. xii. 79).

It is a very strongly odorous species.

4. LAVANDULA.

Lavandula, Linn. Gen. n. 711; Benth. et Hook. Gen. Pl. ii. 1179.

A considerable genus of scented herbs or shrubs having its headquarters in the Mediterranean region, but extending westwards to the Canary Islands, and eastwards to India.

L. Nimmoi, Benth. in DC. Prod. xii. 148.

Herba caule patentim villosulo; foliis pinnatisectis segmentis oblongis obovatisve inciso-dentatis pinnatifidisque utrinque viridibus parce hirsutis; spicis gracilibus; foliis floralibus lanceolatis acutissime acuminatis calyces villosulos æquantibus; floribus solitariis alternis.

Perennis effuse ramosa 1–2-pedalis. *Folia* varie pinnatisecta et pubescentia interdum fere *L. multifidæ* similia sed longius petiolata lobis latioribus. *Spicæ* 1–3-pollicares. *Calyx* viridis $\frac{1}{5}$ poll. longus, dentibus lanceolatis acutissimis. *Corolla* calyce duplolongior.

Socotra. Abundant both on the plains and on the hills. B.C.S. nn. 486, 507, 689. Schweinf. nn. 220 in lit., 361, 657. Hunter n. 4. Nimmo.

Distrib. Endemic.

This species was described by Bentham, from Nimmo's specimens now in Kew Herbarium, in DC. Candolle's Prodromus, and is there referred to the shores of the Red Sea. But it is undoubtedly one of the plants got by Nimmo from Socotra.

In habit it closely resembles the Aden *L. setifera*, T. Anders. (in Journ. Linn. Soc. v. (1860), Suppl. 29), but it wants the setaceous bracts.

In Socotra the form of the plant from the dry plains is a much branched diffuse herb with few inconspicuous, small (often a half-inch long) leaves varying much in pubescence, sometimes becoming almost glabrous. The bracts are

widely ovate and acuminate, and the calyx shortly toothed, the whole spike being densely pubescent. This is our n. 486, Schweinfurth's n. 361.

The plant as it occurs on the hills is, however, a loosely slightly-branched one, always densely hairy and having large conspicuous leaves. The bracts are gradually tapered, the calyx more longly toothed, and the spike is less densely pubescent, rather more pilose. This is the form of the plant described by Bentham. B.C.S. n. 507. Schweinf. n. 657.

We have another set of specimens from high altitudes, in leaf only, showing a form possessing very large and hairy leaves, often two and a half inches long, and one inch broad. B.C.S. n. 689.

5. MICROMERIA.

Micromeria, Benth. in Bot. Reg. sub. t. 1282; Benth. et Hook. Gen. Pl. ii. 1188.

A large genus of wide range in the tropics of both old and new worlds, sometimes extratropical.

M. microphylla, Benth. Lab. 377, and in DC. Prod. xii. 219; Boiss. Flor. Orient. iv. 572.

M. Forbesii, Benth. *loc. cit.*
M. ovata, Benth. *loc. cit.*; Ach. Rich. Tent. Flor. Abyss. ii. 189.
M. sphaciotica, Boiss. and Heldr.; Boiss. Diagn. ser. i. 12, 48; Benth. *loc. cit.*
M. Teneriffæ, Benth. *loc. cit.*
M. terebinthinaceâ, Webb et Berthel. Phyt. Canar. iii. 80, t. 164.
M. filiformis, Benth. *loc. cit.*
M. punctata, Benth. *loc. cit.*; Ach. Rich. *loc. cit.*
M. biflora, Benth. *loc. cit.*

For the older synonymy, see Bentham *loc. cit.*

Nom. Vern. Theijèijah (Schweinf.).

Socotra. Abundant. B.C.S. nn. 213, 613, 631. Schweinf. nn. 529, 600.

Distrib. A widely dispersed and variable species occurring in the Canary and Cape de Verde islands, south Europe, north-east Africa, and through Arabia to northern India.

We have from Socotra an extensive series of specimens, which, differing from one another in minor characters, yet all naturally come within one specific limitation, and on comparing them with the specimens of *Micromeria* in Kew Herbarium and with Bentham's descriptions, I am convinced that the many allied plants from different regions which he doubtfully maintained as separate species are better regarded as so many forms, perhaps geographical, of one widely-dispersed species. I have therefore brought together above such of them as I take to be conspecific, adapting for the specific name that which has been most frequently used, although another of the synonyms antedates it.

The character by which specific diagnoses have been made,—long branching or compact habit, glabrousness or more or less pubescent vestiture, breadth of leaf, solitary or fascicled stalked or sessile flowers, narrow or broad calyx, —are features which are by no means constant, and in our Socotran plants we have almost every degree of variation in these respects. I doubt, indeed, whether it is possible to keep up, even as distinct varieties, all the old specific forms.

It appears to me that this widely-spread species may in any one locality vary in two directions, and thus all the forms seem to fall into two groups characterised thus:—

a. **remota**: ramulis internodiisque elongatis; foliis remotis.

b. **imbricata**: ramulis internodiisque brevibus; foliis approximatis subimbricatis.

Of the first set, *M. filiformis*, Benth. (sp. typ. ex herb. Gay), and *M. microphylla*, Benth., south European forms, may be taken as typical, along with the Canary island plant, *M. Teneriffæ*, Benth. (*M. terebinthinacea*, Webb). The branches may be greatly elongated, often rigid, and are commonly more or less purple, and, owing to the length of the internodes, the leaves are far apart. These are frequently purple, usually glabrous and shining, often very small and somewhat narrowed, never subrotundate, but occasionally they become pubescent. The flowers may be either solitary or fascicled and the calyx may be narrow or wide, one-sixth inch long or under one-eighth inch. In this group we include also the Cretan *M. sphaciotica*, Boiss., the Abyssinian *M. ovata* (ex herb. Schimp. Abyss. sect. i. n. 1859), some Abyssinian specimens (ex herb. Roth, n. 508), and also some Indian plants (ex herb. Griffith, n. 3979, sub *M. biflora*). Our Socotran specimens, n. 213, and Schweinfurth's n. 529, also come into this set, which has thus a very wide distribution.

The second set is typified in the Indian *M. biflora*, Benth. The leaves in this group are usually larger, much broader, and often nearly rotundate, and owing to the shortness of the internodes are close set somewhat imbricated when dry, and they may be glabrous or pubescent. The flowers are either solitary or fascicled and sometimes are almost or quite sessile. Into this section goes the true *M. punctata*, Benth., from Abyssinia and Somali Land, and *M. Forbesii*, Benth., from Teneriffe; also almost all the Indian and Arabian plants described as *M. biflora*, and probably also some forms from Abyssinia under *M. ovata* (in herb. Schimp. Abyss. n. 12). Our Socotran specimens, n. 631, Schweinfurth's n. 600, belong here. The Indian forms we find are, as a rule, glabrous. The Socotran specimens, like those from Teneriffe, are more or less pubescent. One specimen sent by Schweinfurth is much more so than almost any other form I have seen. The Abyssinian plants are commonly pubescent, and have usually elongated leaves. This group has

an extensive distribution, but apparently does not run into Europe. With the last set it is represented both in the Canary Islands and in Socotra.

It may be possible within these groups to recognise local varieties, but I shall not enter upon that question here.

The plant has a tendency to form galls from the attacks of some Cecidomyia. n. 613 shows this.

6. LEUCAS.

Leucas, R. Br. Prod. 504; Benth. et Hook. Gen. Pl. ii. 1213.

A large genus of usually woolly plants of the Asiatic and African tropics, and introduced in America. Of the four Socotran species, one is endemic, belonging to a section of the genus that is essentially Asiatic or Australian, one is a native of north-east Africa alone, and one of the Indian Peninsula alone, and the fourth is common to north-east Africa and south-west Asia.

1. L. (Hemistoma) **urticæfolia**, R. Br. Prod. 504; Benth. in DC. Prod. xii. 524; Ach. Rich. Tent. Flor. Abyss. ii. 199; Boiss. Flor. Orient. iv. 778; Wight Ic. t. 1451.

L. affinis, R. Br. in Salt. Abyss. app.
Ballota arabica, Hochst. et Steud. in herb. Schimp. Arab. n. 818.

Socotra. Common near Galonsir, Tamarida, and elsewhere. B.C.S. n. 726. Schweinf. n. 390.

Distrib. South-west Asia and north-east Africa.

2. L. (Loxostoma) **Neuflizeana**, Courb. in Ann. Sc. Nat. sér. 4, xviii. (1863), 145.

L. paucicrenata, Vatke in Linnæa xliii. (1880), 98.

Socotra. At Tamarida. Schweinf. nn. 337, 733 in lit.

Distrib. Abyssinia, Dessi island, east tropical Africa.

A little-known species described by Courbon in his account of the flora of the island Dessi in the Red Sea. Ehrenberg had many years previously collected specimens of the same plant in Abyssinia. Hildebrandt's specimen from "N-Dara (Taita)," described as *L. paucicrenata*, by Vatke, is a more villous form than the Abyssinian plant, but is undoubtedly the same species.

3. L. (Ortholeucas) **lanata**, Benth. in Wall. Pl. As. Rar. i. 61, and in DC. Prod. xii. 525.

L. collina, Dalz. in Hook. Kew Journ. ii. (1850), 338.

Socotra. On the Haghier hills. Not frequent. B.C.S. n. 690, Schweinf. n. 611.

Distrib. Through the Indian Peninsula.

I have not been able to discover sufficient ground for separating our Socotran plant from this species, and it appears to me that the two Indian forms quoted above are hardly specifically distinct.

In habit our plant takes more after Dalzell's plant, but the calyx is much shorter and the calyx-teeth hardly so elongate. The corolla, too, has the upper lip scarcely so much arched or so long, and the anther-lobes are more constricted and narrower than in the Indian specimens. Further, the leaves in our specimens are commonly dark on the upper surface, a character not so often seen in true *L. lanata*, and the larger ones are more persistently truncate at the base.

From the nearly allied *L. montana*, Spreng. (Syst. ii. 742; Benth. in DC. Prod. *loc. cit.*) and *L. mollissima*, Benth. (in Wall. Pl. As. Rar. i. 62, and in DC. Prod. *loc. cit.*), the spreading hairs on the stem readily distinguish it.

4. **L.** (Ortholeucas) **virgata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 91.

Suffruticosa virgata ramis fulvis; foliis petiolatis plus minusve obovatis v. spathulatis v. subellipticis integris v. superne trilobatis crassiusculis velutino-pubescentibus; verticellastris 3-floris; bracteis calyce multo brevioribus; calycis dentibus brevissimis.

Suffrutex 1–3-pedalis virgatus laxe v. sæpe intricato-ramosus ramulis lignosis ultimis haud raro ad extremitates marcescentibus sulcatis fulvis breviter pubescentibus. *Folia* petiolata plus minusve obovata v. obcuneatim deltoidea v. spathulata v. subelliptica magnitudine variantia sæpe $\frac{3}{4}$ poll. longa $\frac{5}{6}$ poll. lata petioloque $\frac{2}{5}$–$\frac{1}{4}$ poll. longo interdum $\frac{1}{6}$ poll. longa $\frac{1}{10}$ poll. lata petioloque $\frac{1}{8}$ poll. longo, maxima apice obtusa sæpe emarginata v. superne rotundata, trilobata lobo medio maximo et emarginato inferne integra et in petiolum gradatim attenuata subtus pallidiora dense velutino-tomentosa incana demum sæpe solum glandulosa supra velutino-pubescentia subglabrescentia, minima plerumque spathulata crassiuscula subtus pallidiora incana dense velutino-pubescentia. *Verticillastri* parvi 3-flori; bracteæ subulatæ brevissimæ vix $\frac{1}{12}$ poll. longæ. *Calyx* $\frac{1}{4}$ poll. longus rectus basi angustatus ore æquali, dentibus 10 minutis alterne parum brevioribus, costis striguloso-pubescentibus intervallis glandulosis. *Corollæ* tubus $\frac{1}{3}$ poll. longus intus piloso-annulatus extus ad partem inferiorem calyce inclusam glaber superne cum limbo pilis deflexis vestitus glandulosusque, limbi lobus posticus cucullatus pilis longis fimbriatus, anticus postico longior $\frac{1}{4}$ poll. longus 3-lobatus lobo medio maximo obovato bilobato crenulato. *Stamina* corolla longiora. *Discus* inconspicuus. *Nuculæ* $\frac{1}{10}$ poll. longæ glabræ maculatæ.

Socotra. Very abundant. B.C.S. nn. 141, 274, 543, 548. Schweinf. n. 343.

Distrib. Endemic.

This is one of the commonest undershrubs on the island. It varies somewhat in habit and in size of foliage. In some situations on the plains it forms a very densely and intricately branched small-leaved undershrub, with the

branches often withering at the ends; in other places it has long curved wide-spreading somewhat decumbent branches, or there may be long ascending rigid twigs. In these latter forms the leaves are much larger than in the first mentioned. It is quite a distinct species in the *Ortholeucas* section of the genus, marked by its habit, small leaves, and the small flower clusters.

7. LASIOCARYS.

Lasiocarys, Benth. Lab. Gen. et Sp. 600; Benth. et Hook. Gen. Pl. ii. 1213.

A small genus of five species, one being south African, two Abyssinian, and two are endemic in Socotra. Both the Socotran forms differ from all others in their prickly habit and in inflorescence.

1. L. spiculifolia, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 92. Tab. LXXXI, A.

Suffruticosa nana; foliis spiculiformibus v. triaculeatis; floribus solitariis axillaribus.

Suffrutex humilis spiculosus caulibus sæpe prostratis cortice crasso rugoso profunde sulcato multo intricatoque ramosis, ramulis ultimis tenuibus adscendentibus puberulis albidis ad nodos tumidis et axillares contractos ramulos gerentibus. *Folia* parva $\frac{1}{3}$–$\frac{1}{2}$ poll. longa v. minora rigida sessilia opposita oblanceolata et spiculiformia ad extremitates ambos attenuata apiceque longe pungentia v. in parte superiore triaculeata hastata spiculo medio maximo inferneque gradatim attenuata spiculis plerumque lateraliter patentibus obscure glandulosa puberula viridia venulis striata supra subconcava. *Flores* in axillis superioribus solitarii brevissime pedicellati foliis plerumque breviores; bracteæ minutæ subulato-pungentes pedicellis longiores. *Calyx* $\frac{1}{3}$ poll. longus glaber rigidus tubuloso-campanulatus parum obliquus 10-costatus 5-fidus, segmentis acuminatis pungentibus patentibus subæqualibus. *Corolla* fere $\frac{1}{3}$ poll. longa, tubo incluso intus piloso-annulato extus basi glabro superne pilis deflexis vestito, limbi lobo postico concavo emarginato dense pilis longis hirto, antico extus villoso et glanduloso trilobato lobo medio majore obovato emarginato lateralibus ovatis obtusis. *Stylus* inclusus. *Nuculæ* glabræ oblongæ $\frac{1}{6}$ poll. longæ.

Socotra. A scrub plant of the plains. B.C.S. n. 216.

Distrib. Endemic.

A species clearly marked out by its spicular leaves and solitary axillary flowers from all others in the genus. The very thick corky bark on the stems is another very interesting feature.

This is one of the plants which makes progress over many parts of the plains unpleasant on account of its dart-like and often triaculeate leaves. The mimicry in foliage between this species and the Acanthaceous *Blepharis spiculifolia* is worthy of note.

2. L. flagellifera, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 92. Tab. LXXXI, B.

Flagellifera; foliis spathulatis v. cochleariformibus cum dentibus 5–7 pungentibus; floribus solitariis axillaribus.

Perennis flagellifera flagellis longe repentibus ramos laterales contractos ad nodos gerentibus

internodiis $1\frac{1}{4}$ poll. longis, juvenilibus longe pilosis. *Folia* petiolata $\frac{2}{3}$ poll. longa ad ramos laterales contractos dense rosulatim conferta cochleariformia v. spathulata parte superiore expansa $\frac{1}{6}$–$\frac{1}{4}$ poll. diam. superne 5–7-dentata dentibus acuminato-subulatis pungentibus inferne integra cuneatim in petiolum longum attenuata crassiuscula 5–7-nervia nervis subtus prominentibus firmis glanduloso-puberula et pilis longis sericeis varie vestita; petiolus $\frac{1}{4}$ poll. longus complanatus sulcatus basi amplexicaulis dense sericeo-villosus. *Flores* in axillis solitarii brevissime pedicellati bracteis setoso-subulatis longe pilosis calyce parum brevioribus. *Calyx* $\frac{1}{4}$ poll. longus extus glanduloso-puberulus et pilis paucis longis vestitus intus nitidus et pilis adscendentibus instructus, tubo campanulato ore æquali, limbi dentibus 5 æqualibus deltoideis acuminatis subulato-pungentibus. *Corolla* $\frac{5}{12}$ poll. longa, tubo extus inferne glabro superne pubescente intus piloso-annulato et antice leviter pubescente, limbi lobo postico parum concavo oblongo-obovato emarginato dorsaliter margineque dense villoso, antici lobi segmento medio maximo subspathulato emarginato crenulato segmentis lateralibus obliquis truncatis. *Stamina* corolla breviora, filamentis acerosis et basi pilosiusculis. *Discus* crenatus.

Socotra. On the limestone cliffs south-west of Galonsir. B.C.S. n. 233.

An extremely interesting form of this genus differing from all hitherto described. Like the last mentioned species it is prickly, although the leaves are not hard and glabrous, and it has also solitary axillary flowers. The feature by which it is distinctly marked out is its habit. On the limestone cliffs in the only situation where we found it, its long runners spread over the rocks to a great distance, and the nodes producing plantlets which fix themselves in the crevices of the rotting stone, the plant thus covers a wide area.

8. TEUCRIUM.

Teucrium, Linn. Gen. n. 706; Benth. et Hook. Gen. Pl. ii. 1221.

A very large genus of both warm and temperate climates, having its maximum in the Mediterranean region. Both the Socotran species are endemic.

1. T. (Polium) **prostratum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 92.

Prostratum ramis incanis; foliis petiolatis oblongis apice truncatis dentatis basi abrupte contractis revolutis; floribus in capitula pauciflora dispositis; corolla calyce pubescente duplolongiore.

Perenne parvum prostratum basi lignosum ramosissimum ramulis incanis patentibus subprostratis ultime adscendentibus. *Folia* brevissime petiolata $\frac{1}{4}$–$\frac{1}{6}$ poll. longa oblonga apice truncata obscure dentata basi abrupte in petiolum contracta margine integra revoluta firma supra plus minusve rugosa pubescentia medio sulcata subtus incana venulis prominentibus; petiolus $\frac{1}{12}$ poll. longus. *Flores* breviter pedicellati in axillis foliorum superiorum solitarii et nonnunquam in pauciflorum capitulum folia excedentem conferti. *Calyx* tubuloso-campanulatus $\frac{1}{6}$ poll. longus pubescens, dentibus 5 late ovatis acutis subciliatis. *Corolla* $\frac{5}{12}$ poll. longa extus puberula intus antice palato piloso, limbi lobo medio maximo subspathulato concavo obtuso margine sinuato-crenato, lobis lateralibus minimis. *Stamina* longe exserta, filamentis basi pilosiusculis. *Nuculæ* valde rugosæ.

Socotra. At the base of the limestone cliffs near Galonsir, and also near Tamarida. B.C.S. nn. 342, 547. Hunter.

Distrib. Endemic.

A very odorous species. It is nearly allied to *T. Polium*, Linn. (Sp. 792; Benth in DC. Prod. xii. 591), widely spread in south Europe, north-east Africa, and south-west Asia, but it is readily distinguished by its somewhat petiolate leaves, and its flowers not so densely and distinctly capitate. With *T. montanum*, Linn. (Sp. 791; Benth. *loc. cit.* 593), also a native of south Europe, there is a near affinity, but the smaller leaves, the flower-heads, and the long subulate acuminate calyx-teeth of that species distinguish it.

2. T. (Polium) **petiolare**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 92.

Perenne a collo ramosum ramis adscendentibus plus minusve incanis; foliis longe petiolatis ellipticis superne serrato-crenatis inferne integris obtusis parum revolutis supra viridibus subtus incanis; calycis dentibus deltoideis; corolla calycem pubescentem excedente.

Suffrutex radice lignoso a collo multiramosus ramis adscendentibus incanis v. velutino-pubescentibus. *Folia* longe petiolata $\frac{2}{3}$–$\frac{5}{6}$ poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata elliptica v. oblongo-elliptica v. subobovata obtusa basi in petiolum gradatim attenuata margine parum revoluta superne serrato-crenata inferne integra crassiuscula supra viridia obscure puberula venuloso-sulcata sæpe glabrescentia nitida subtus incana venulis prominentibus; petiolus $\frac{1}{5}$–$\frac{1}{4}$ poll. longus. *Flores* in axillis supremis solitarii spicas capitatas $\frac{2}{3}$ poll. diam. formantes. *Calyx* tubuloso-campanulatus $\frac{1}{4}$ poll. longus pubescens glandulosus, dentibus subæqualibus deltoideis acutis pilis longis ciliatis. *Corolla* $\frac{5}{12}$ poll. longa extus inferne glabra superne leviter puberula et glandulosa intus antice pilosa, limbi lobo medio maximo parum concavo subpanduriformi integro obtuso, lobis lateralibus oblongis obtusis minoribus. *Stamina* breviter exserta, filamentis sparsim pilosis. *Nuculæ* valde rugosæ.

Socotra. On the hills south of Galonsir, and on Haghier. B.C.S. n. 431. Schweinf. n. 566.

Distrib. Endemic.

Another novelty of the same section of the genus as the foregoing, and probably having most affinity with *T. buxifolium*, Schreb. Unilab. 42; Benth. in DC. Prod. xii. 591, a species from south Spain. But ours is altogether a larger plant, and is distinguished by its longly-petiolate leaves, and its flowers with the longish calyx not much exceeded by the corolla. *T. montanum* may also be compared as an ally.

Schweinfurth sends a specimen, n. 578, which I refer to this species, gathered by him at an altitude of 3000 feet on the Haghier hills. It differs from the type in the persistently pubescent character of the whole plant, in the absence of hoariness, which is only visible on the under surface of some of the upper leaves, and in the longer branches with larger leaves, which are not so thick, and are very decidedly oblong or narrowly elliptic. It may be named a variety as,—

var. **pubescens**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Pubescens nonincanum ramis folia majora gerentibus.

Socotra. On the Haghier hills. Schweinf. n. 578.

DISTRIB. Endemic.

Order LVIII. PLANTAGINEÆ.

A small order with representatives in every part of the globe, but most abundant in temperate zones.

PLANTAGO.

Plantago, Linn. Gen. n. 142; Benth. et Hook. Gen. Pl. ii. 1224.

A large genus with the distribution of the order.

P. amplexicaulis, Cav. Ic. Rar. ii. 22, t. 125; Dcne. in DC. Prod. xiii. 1, 719; Boiss. Flor. Orient. iv. 883.

P. Bauphula, Edgew. in Journ. Asiat. Soc. Beng. vii. 2. (1838), 766; Dcne. *loc. cit.*
P. salina, Dcne. *loc. cit.* 720.

Socotra. Abundant on the plains. B.C.S. n. 200.

DISTRIB. From the Canary islands through the Mediterranean region eastwards to Arabia, Persia, Affghanistan, and southern India.

GENUS ANOMALUM.

WELLSTEDIA.

Wellstedia, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Flores hermaphroditi, regulares. Calyx alte 4-partitus, persistens, tubo basi ovario adnato, lobis angustis acutis æqualibus extus adpresse rigide pilosis. Corolla hypocrateriformis, tubo cylindraceo extus intusque glabro sub fructu a basi sursum in segmenta 4 rumpente, limbi lobis 4 ovatis v. deltoideo-ovatis æqualibus extus adpresse pilosis imbricatis. *Stamina* 4, æqualia, angulis corollæ loborum inserta, filamentis liberis subulatis incurvis corollæ lobis paulum brevioribus; antheræ cordato-rotundatæ v. suborbiculares, 2-loculares, loculis parallelis introrsis rima longitudinali, dorso affixæ. Discus 0. Ovarium 2-carpellatum, 2-loculare, compressum, integrum, parte triente inferum, inferne glabrum, superne basin styli circum dense albido-setosum; stylus validus, calycis lobis subæquilongus, adpresse rigide pilosus, bifidus, stigmatibus parvis terminalibus; ovula anatropa, in loculo quoque solitaria, (plerumque in uno abortivum?), ab placentis sub apice septi medii affixis pendula, funiculo brevi. Capsula oblique subobcordata, inæqualiter bilobata, complanata, bilocularia, loculo majore vacuo, angustiseptata, loculicide dehiscentia, valvis coriaceis a septo crustaceo tenui uninervio in loculum vacuum convexo semenque amplectente secedentibus, extus adpressis rigidis pilis vestita. Semen solitarium, septo pendulum, complanatum, obliquum, superne

truncatum, inferne acutum, testa tenui comosa; embryo magnus, cotyledonibus carnosis ovatis plano-convexis accumbentibus radicula longioribus, radicula supera tereti, albumine nullo.—Suffrutex pulvinatus, parvus, ramis congestis, omnino pilis rigidis adpressis vestitus. Folia alterna, subimbricata, anguste spathulata v. obovata, obtusa. Stipulæ 0. Flores in axillis sessiles, spicas unilaterales breves formantes.

A monotypic endemic genus, and one of the most peculiar plants in the whole flora.

Its most noteworthy features are its depressed Boragineoid habit and alternate leaves, the calyx adnate to the ovary, the gamophyllous tetramerous regular floral envelopes, four equal epipetalous stamens, the two-celled ovary with a solitary pendulous ovule in each loculus, the loculicidally septifragal capsule containing a single exalbuminous seed embraced by the isolated septum, and the large embryo with accumbent cotyledons and superior radicle,—altogether, making a combination with which I can find no parallel.

The gamopetaly, andrœcial characters, and the bicarpellary ovary, indicate its position in the series Bicarpellatæ of the Gamopetalæ, but the somewhat inferior ovary is a character exhibited only in a few Apocynaceæ, Asclepiadaceæ, and Gesneraceæ in this series, and with none of these families has our plant any near affinity.

Amongst the Inferæ of the Gamopetalæ, the only family in which the technical characters are such as to admit of our considering the question of incorporating our plant, is Rubiaceæ. But the alternate leaves, the absence of stipules and of a floral disk, at once exclude our genus.

There is no polypetalous order occasionally exhibiting gamopetaly of which we can regard our plant as an aberrant type.

In spite of the slight epigyny we must, I think, regard our plant as one of the Bicarpellatæ; and whilst I have, for the present, preferred to locate the genus as an anomalous one of the Gamopetalæ, I may here indicate the affinities, and the probable ultimate position of it.

As I have above mentioned, its habit is thoroughly Boragineoid, indeed it has quite the look of one of the desert species of *Heliotropium*, or some nearly allied genus. Against its incorporation in Borragineæ, the capsular fruit is, perhaps, the greatest difficulty to overcome, and then, whilst it has the characteristically superior radicle of the order, the ovule is pendulous and anatropous, not erect with a superior micropyle as is typical. Besides, the accumbent cotyledons are a feature not described in the family.

Mr Bentham, who has very kindly given an opinion upon the plant, writes "it is certainly very anomalous. It seems to me to come nearest to Verbenaceæ, amongst which we exceptionally find (though in very few cases) dehiscent fruits or alternate leaves." The characters which seem most to militate against its position in Verbenaceæ are, in addition to those indicated by Mr Bentham, the accumbent cotyledons with the superior radicle,—this

latter being a most important character as Mr Bentham mentions (Benth. et Hook. Gen. Pl. ii. 1132), by which genera of Borragineæ may be easily separated from Verbenaceæ, as it occurs only in very few of the latter family, —and in Verbenaceæ we do not find plants with the habit shown by our genus. Some few genera in the family, it is true, are of prostrate and woody habit, and bear imbricated leaves, but they want the indumentum so characteristic of our plant, which is that of the Borragineæ.

Loganiaceæ have a number of characters with which our plant agrees, but the copious albumen and small embryo, and the opposite leaves, do not admit of our associating the genus with it.

Convolvulaceæ cannot include the genus on account of its pendulous ovules and superior radicle, and from Scrophularineæ the very regular flowers, the lateral carpels, and the solitary seed seem to exclude it.

The free septum embracing the seed recalls the retinaculum of Acanthaceæ, but is of quite a different nature, and there is no near relation with this family.

Of all the Bicarpellate families, Borragineæ and Verbenaceæ are the two with which our plant appears to have most affinity. And whilst the weight of Mr Bentham's opinion is in favour of the latter, yet, especially on account of the habit, indumentum, and foliage, I am inclined to consider the family with which our plant has closest affinity, and with which it may be hereafter joined, to be Borragineæ.

ETYM. The name is in honour of Lieut. Wellsted, who explored the island of Socotra for the Indian Government in 1834, and who published the first good account of the island (see Journ. Roy. Geog. Soc. v. (1835), 129).

W. socotrana, Balf. fil. *loc. cit.* Tab. LXXXII, A.

Lignosa canescens multiramosa ramulis brevissimis tortuosis et congestis inferne foliis marcidis vestitis. *Folia* $\frac{1}{3}$–$\frac{1}{2}$ poll. longa $\frac{1}{8}$ poll. lata basi late inserta imbricata subsecunda persistentia crassiuscula induplicata dense pilis albidis rigidis adpressis vestita. *Calycis* lobi $\frac{1}{12}$ poll. longi a basi angustati. *Corollæ* tubus $\frac{1}{14}$ poll. longus, lobi $\frac{1}{18}$ poll. longi. *Capsula* $\frac{1}{5}$ poll. diam., valvis intus glabris nitidis. *Semina* superne truncata inferne acuta, testa circum radiculam incrassata atriore glabra obscure foveolata inferne pilis sursum versis vestita.

Socotra. B.C.S. n. 569. Hunter.

DISTRIB. Endemic.

A small dwarf plant, very like a Heliotrope or stunted Scrophularineous species.

MONOCHLAMYDEÆ.

Order LIX. NYCTAGINEÆ.

A small family, the genera of which are almost exclusively American. Of the two genera which extend to the old world, one has three representatives in Socotra.

BOERHAAVIA.

Boerhaavia, Linn. Gen. n. 9; Benth. et Hook. Gen. Pl. iii. 5.

A small genus of badly-defined widely-spread species inhabiting the warmer regions of the globe. The three Socotran species have a wide range, but one is confined to the old world.

1. B. repens, Linn. Sp. 5; Choisy in DC. Prod. xiii. 2, 453; Ach. Rich. Tent. Flor. Abyss. ii. 209; Boiss. Flor. Orient. iv. 1045 syn. plur. excl.; Franch. Sert. Somal. in Miss. Révoil 61; Delile Fl. Egypt. 2, t. 3, f. 1.

Socotra. On the plains. Common. B.C.S. n. 54.

Distrib. From north-east Africa eastwards to China.

The compact small viscid form of this species, which is typical of the Abyssinian and Arabian plains, is the commonest on the island.

2. B. diffusa, Linn. Sp. 4; Choisy in DC. Prod. xiii. 2, 452; Ach. Rich. Tent. Flor. Abyss. ii. 208; Franch. Sert. Somal. in Miss. Révoil 61.

B. repens, L., var. *diffusa*, Boiss. Flor. Orient. iv. 1045.

B. procumbens, Roxb. Flor. Ind. i. 146; Wight Ic. t. 874.

Nom. Vern. Attif (Schweinf.).

Socotra. Common on hill slopes. B.C.S. n. 629. Schweinf. n. 370.

Distrib. A common weed in the warmer parts of the world.

3. B. scandens, Linn. Sp. 4; Choisy in DC. Prod. xiii. 2, 454; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 33.

B. repanda, Willd. Sp. Pl. i. 22; Choisy *loc. cit.* 455; Wight Ic. t. 1766.

B. grandiflora, Ach. Rich. Tent. Flor. Abyss. ii. 209.

B. plumbaginea, Cav. Ic. ii. 7, t. 112; Boiss. Flor. Orient. iv. 1044.

For further synonymy, see authors quoted.

Socotra. Abundant. B.C.S. n. 65.

Distrib. Maritime regions of warmer parts of the whole world.

A very variable plant.

Order LX. ILLECEBRACEÆ.

A small order the genera of which are spread, especially in dry and warm regions, over the whole world. Two species are found in Socotra, and each is the type of a new genus.

1. HAYA.

Haya, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Flores hermaphroditi, parvi, ad nodos glomerati, bracteis scariosis stipuliformibus involucrati. Perianthium 5-partitum, album; segmenta æqualia, oblonga, obtusa, mutica, erosa v. emarginata, tenuia, enervia, basi subcrassa. Stamina 5, basi segmentorum inserta, staminodiis minutissimis alternantia, filamentis subulatis; antheræ biloculares. Ovarium parvum, trigonum, membranaceum; stylus filiformis, elongatus, stigmate capitellato; ovulum solitarium, basilare, erectum, anatropum, funiculo longo tereti. Fructus tenuis, basim versus in valvas tres dehiscens. Semen erectum, ellipsoideum, testa crustacea; embryo dorsalis, albumine farinaceo applicitus, leviter curvatus, radicula infera.—Herba annua, diffuse divaricatim ramosa, glabra. Folia sessilia, 3-verticillata, obovata, apiculata, integerrima; stipulæ minutæ, ovatæ, acuminatæ, scariosæ. Flores sessiles, in dichasia brevia secunda oppositifolia et axillaria conferti; bracteæ parvæ, fusco-brunneæ, scariosæ.

A monotypic endemic genus belonging to the tribe *Pollichieæ*. Its nearest ally is the monotypic *Illecebrum*, distributed in west Europe and northern Africa. But from that genus the whole character of our plant separates it, its inflorescence, perianth, and three-valved fruit being the more prominent diagnostic features.

Etym. I have named this genus after George Hay, M.D., Port Surgeon at Aden, to whom I am indebted for much kindness and assistance in carrying out the objects of our expedition, and who, an accomplished naturalist, has done much to advance our knowledge of the flora and fauna of Aden and the adjacent country.

H. obovata, Balf. fil. *loc. cit.* Tab. LXXXIII.

Herbacea vix pedalis a collo multiramosa ramulorum internodiis elongatis rectis tenuibus. *Folia* $\frac{2}{3}$–1 poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata ad nodum quemque 2 lateralia majora 1 minus inflorescentiæ oppositum obovata v. subspathulata. *Stipulæ* $\frac{1}{12}$ poll. longæ. *Inflorescentia* $\frac{2}{5}$ poll. diam. ramulis brevissimis; bracteæ florales 8–10 $\frac{1}{8}$ poll. longi. *Perianthii* segmenta $\frac{1}{12}$ poll. longa. *Stamina* perianthiis breviora. *Stylus* ovario multo longior. *Fructus* minutus $\frac{1}{24}$ poll. longus.

Socotra. Not uncommon on the hill slopes. B.C.S. n. 250. Schweinf. n. 554.

Distrib. Endemic.

2. LOCHIA.

Lochia, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Flores consimiles, bracteis scariosis non-involucratis. *Perianthium* herbaceum, demum induratum, 5-lobum, tubo brevissimo obconico angulato, fauce disco tenui annulari instructa

lobi conniventes, ovato-oblongi, firmi, dorso infra apicem mucronati. *Stamina* 5, perigyna, cum staminodiis setosis alternantia, filamentis brevibus; antheræ parvæ, oblongæ. *Ovarium* ellipsoideum, liberum; stylus filiformis, apice bifidus; ovulum amphitropum, funiculo basilari erecto longiusculo complanato suspensum. *Utriculus* membranaceus, demum basi ruptus. *Semen* ab apice funiculo suspensum, inversum, compressum, testa membranacea.—*Fruticulus* rigidus, salsoloideus, diffusus, caulibus tortis, ramulis intricatis nodosis. *Folia* opposita et in axillis fasciculata, sessilia, anguste lanceolata v. spiculiformia, integerrima, crassa; stipulæ interpetiolares, connatæ, breves, hyalinæ. *Flores* parvi, in dichasia breviter ramosa terminalia bracteis obtegentibus majoribus membranaceis brunneis dispositi, sessiles.

Another monotypic endemic genus. Of the genera in the tribe *Paronychieæ*, in which it falls, *Gymnocarpos* is its closest ally. That genus is monotypic, and is spread through the Mediterranean region and reaches from the Canary islands to Scindh. Though of the same habit and foliage our plant differs from the generic character of *Gymnocarpos* in flower and inflorescence, the most salient features of difference being its large membranous bracts of the cymes, the short perianth-tube with connivent lobes, short stamens, and non-adherent ovary.

ETYM. I have named this genus after General Loch, C.B., Commandant at Aden at the time of our expedition, who did everything in his power to make our expedition successful, and from whom I received much hospitable kindness.

L. bracteata, Balf. fil. *loc. cit.* Tab. LXXXIV.

Suffruticosa 1–2-pedalis cortice griseo ramis plurimis contractis lateralibus ramulisque terminalibus elongatis subtetragonis compressis albido-lepidotis. *Folia* $\frac{1}{3}$–$\frac{1}{2}$ poll. longa $\frac{1}{12}$ poll. lata ad extremitates ambos attenuata viridia glabra. *Stipulæ* late ovatæ acutæ v. apice setosæ. *Dichasia* vix 1 poll. diam.; bracteæ late ovatæ v. subrotundatæ acutæ late insertæ membranaceæ fusco-brunneæ $\frac{1}{5}$–$\frac{1}{4}$ poll. longæ flores obtegentes. *Perianthium* $\frac{1}{5}$ poll. longum, lobis imbricatis apice subcucullatis margine membranaceis nervo medio dorsaliter prominulo. *Staminodia* filamentis staminum multo longiora. *Ovarium* $\frac{1}{10}$ poll. longum obscure puberulum.

NOM. VERN. Kalkaho (B.C.S.).

Socotra. On the slopes of Haghier. Not common. B.C.S. n. 429.

DISTRIB. Endemic.

A very beautiful undershrub, striking by the contrast of its rich brown inflorescences and bright green leaves.

Order LXI. AMARANTACEÆ.

A considerable order having representatives in all parts of the globe. Six genera are found in Socotra. Two of them are world-wide and include common weeds of cultivation, three have a considerable range through tropical Africa and Asia, whilst the sixth has a limited distribution in Nubia and east Africa, Arabia and eastern India.

1. DIGERA.

Digera, Forsk. Fl. Ægypt. Arab. 65; Benth. et Hook. Gen. Pl. iii. 28.

A monotypic genus widely spread in the tropics of Asia and Africa.

D. arvensis, Forsk. Fl. Ægypt. Arab. 65; Moq. in DC. Prod. xiii. 2, 324.

D. alternifolia, Aschs. in Schweinf. Flor. Æthiop. 180; Boiss. Flor. Orient. iv. 994.
Desmochæta muricata, Wight Ic. t. 732.

Socotra. At Tamarida. Schweinf. n. 700.

Distrib. Of the genus.

The leaves in the Socotran specimen are rather wider above the middle than is the case in the Arabian and north African specimens, and it is also of a more pubescent character.

2. AMARANTUS.

Amarantus, Linn. Gen. n. 1060; Benth. et Hook. Gen. Pl. iii. 28.

A considerable genus of wide range in both the old and new worlds, many of the species being common weeds of cultivation.

1. **A. (Euxolus) Blitum**, Linn. Sp. 1405; Moq. in DC. Prod. xiii. 2, 263.

Albersia Blitum, Kth. Flor. Berol. ii. 144, ex Boiss. Flor. Orient. iv. 991.

Socotra. Near habitations, common. B.C.S. n. 649.

Distrib. Cosmopolitan.

2. **A. (Euxolus) polygamus**, Linn. Amœn. iv. 294; Wight Ic. t. 714.

Euxolus polygamus, Moq. in DC. Prod. xiii. 2, 272.
Albersia polygama, Kth. Flor. Berol. ii. 144, ex Boiss. Flor. Orient. iv. 991.

Socotra. Occasional. B.C.S. n. 725. Schweinf. n. 686.

Distrib. Tropical Africa and Asia.

Our Socotran specimens show fruits rather larger and more coarsely ribbed than is usual.

3. PUPALIA.

Pupalia, Juss. in Ann. Mus. Par. ii. (1803), 132; Benth. et Hook. Gen. Pl. iii. 31.

A small genus of three or four species which inhabit the tropics of Asia and Africa.

P. lappacea, Juss. in Ann. Mus. Par. ii. (1803), 132; Moq. in DC. Prod. xiii. 2, 331; Ach. Rich. Tent. Flor. Abyss. ii. 217; Boiss. Flor. Orient. iv. 995; Franch. Sert. Somal. in Miss. Révoil 59.

Desmochæta xanthioides, A. Br. in Flora 1841, 285, t. 2, A.

Socotra. On the plains at Galonsir. B.C.S. n. 7.

Distrib. Across tropical Africa, and through Arabia to the east Indies.

4. PSILOSTACHYS.

Psilostachys, Hochst. in Flora 1844, Beil. 6, t. 4; Benth. et Hook. Gen. Pl. iii. 32.

A genus of three species of small herbs, one being found in Arabia and Nubia, one in eastern Africa, and the third, which occurs in Socotra, is known elsewhere only in eastern India.

P. sericea, Benth. et Hook. Gen. Pl. iii. 32.

Achyranthes sericea, Kön. in Roxb. Flor. Ind. i. 765; Wight Ic. t. 726.

Socotra. Not uncommon near Galonsir and Tamarida. B.C.S. n. 43. Schweinf. n. 328.

Distrib. Eastern India (Goozerat).

The Socotra specimens are not so silky as the Indian ones in Kew Herbarium, especially is this the case in Schweinfurth's specimens collected in the palm groves at Tamarida. Our plants, too, are much more lax and straggling than the Indian forms, and the peduncles of the inflorescences are, as a rule, much shorter; indeed, the inflorescences in the axils of most of the leaves are shorter than the leaves themselves. With all these differences there is, I think, no doubt as to the identity of the Indian and Socotran plants.

5. ÆRUA.

Ærua, Forsk. Fl. Ægypt. Arab. 170; Benth. et Hook. Gen. Pl. iii. 34.

A small genus of some dozen species, inhabitants of the warmer regions of Asia and Africa. Two of the four species found in Socotra are endemic. The others have a wide range through tropical Africa and Asia.

1. Æ. javanica, Juss. in Ann. Mus. Par. ii. (1803), 131; Moq. in DC. Prod. xiii. 2, 299; Ach. Rich. Tent. Flor. Abyss. ii. 214; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 31; Boiss. Flor. Orient. iv. 992; Franch. Sert. Somal. in Miss. Révoil 58; Wight Ic. t. 876.

Socotra. Common. B.C.S. n. 41.

Distrib. Tropics of the old world from Cape de Verde islands to Java.

A plant of considerable variability, and with a large synomymy for which the authors cited may be consulted.

2. Æ. microphylla, Moq. in DC. Prod. xiii. 2, 301. Tab. LXXXV.

Suffruticosa multiramosa erecta v. nana caule subtereti obsolete striato glabro cinerascente; foliis fasciculatis v. oppositis petiolatis magnitudine variantibus obovatis v. obovato-spathulatis inferne attenuatis obtusis haud mucronatis glabris vix punctulatis viridibus; spicis 2–3-natis sessilibus divaricatis oblongo-ovatis obtusiusculis villoso-lanatis; floribus haud nitidis subrufo-canescentibus; calyce bracteis obtusissimis duplolongiore, sepalis uninerviis.

Suffrutex semipedalis v. altior sæpe intricato- et copiose nunc laxe ramosus. *Rami* breves parvifoliosi, rami elongati flexiles subdecumbentes sæpe 3-pedales foliis majoribus vestiti. *Folia* parva $\frac{1}{6}$–$\frac{1}{4}$ poll. longa (incl. petiolo $\frac{1}{36}$–$\frac{1}{24}$ poll.) $\frac{1}{24}$–$\frac{1}{10}$ poll. lata, majora 1–1$\frac{1}{4}$ poll. longa $\frac{1}{4}$ poll. lata, crassiuscula coriacea carnosula subglauca siccatione obscura nervo medio subtus obsolete prominulo. *Spicæ* $\frac{1}{4}$–$\frac{1}{2}$ poll. longæ $\frac{1}{5}$–$\frac{1}{4}$ poll. latæ inferiores nutantes superiores ascendentes vix paniculatæ. *Bracteæ* subæquales latissime ovato-orbiculares villosiusculæ albidæ. *Flores* vix $\frac{1}{12}$ poll. longi. *Sepala* vix carinata, exteriora 2 oblonga obtusissima, interiora 3 angustiora obtusa. *Staminodia* filamentis breviora triangulari-linearia acuta truncatula v. emarginata. *Antheræ* subrotundæ. *Stylus* brevis; stigmate minuto. *Utriculus* subrotundus compressus membranaceus griseus. *Semen* sublenticulare inflatum obsoletissime birostratum margine obtusissimum nitidulum fusconigrum.

Socotra. On the plains about Galonsir. B.C.S. nn. 28, 650. Schweinf. n. 702. Nimmo.

Distrib. Endemic.

This species was founded by Moquin upon a fragmentary specimen in herb. Hooker, which belongs to the collection sent by Nimmo and recorded as from the "shores of the Red Sea."* It is undoubtedly as we know it at present, an endemic plant.

The specific name is hardly applicable to the plant as shown by our specimens. It exhibits some variation in habit; on the dry plains a dwarf compact woody undershrub with very small thick leaves, (B.C.S. n. 28, Schweinf. n. 702); in more favourable localities the branches are long, flexible, and bent to the ground, and bear thinner and much larger glaucous leaves, (B.C.S. n. 650). Nimmo's fragmentary specimen is from one of the dwarfed plants, and Moquin's description is, therefore, incomplete as regards the size of the leaves.

3. **Æ. lanata**, Juss. in Ann. Mus. Par. ii. (1803), 131; Moq. in DC. Prod. xiii. 2, 303; Ach. Rich. Tent. Flor. Abyss. ii. 214; Boiss. Flor. Orient. iv. 993; Wight Ic. t. 723.

Æ. floribunda, Wight Ic. t. 1776 bis.

Amarantus aervoides, Hochst. et Steud. in herb. Schimp. Abyss. sect. i. n. 249.

Nom. Vern. 'Feh (B.C.S.).

Socotra. Common near Galonsir and elsewhere. B.C.S. nn. 50, 412. Schweinf. n. 538. Hunter.

Distrib. Tropical Africa eastward to the Indian Archipelago.

This widely-spread old world plant is abundant on the maritime plains of Socotra. It is a species of some variation, and Moquin (*loc. cit.*) names four varieties. Ascherson (in Schweinf. Flor. Æthiop. 174), names two more. But I doubt whether it is possible to determine these varieties with any certainty. Our n. 412, (Schweinf. n. 538), is the commonest type of the species. This

* See, on page 26, remarks under *Hypericum mysorense*, Heyne.

plant is considerably pubescent, the leaves are more or less lanceolate and narrow at the apex, and the spikes are small with the bracts and perianth segments acuminate.

But besides this we have specimens which are remarkable for the great amount of their downy vestiture and in which the bracts and perianth segments are less acuminate. The downiness is most developed in some specimens with a very robust habit, more so than in any specimens in Kew Herbarium, and with leaves much larger and thicker and more rounded at the apex than is typical, and spikes more closely set and longer. As varieties are constituted of this species this may well be one, as—

var. **robusta**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Dense lanata caulibus robustis; foliis crassis magnis apice rotundatis; spicis elongatis.

Socotra. Near Galonsir, on the plains. B.C.S. n. 517. Schweinf. n. 219.

Distrib. Endemic.

Another set of Socotran specimens (B.C.S. n. 50) shows smaller leaved and shorter spiked plants, more nearly resembling the type which Ascherson has taken for his variety *oblongata*.

Æ. floribunda, Wight, appears to be merely a form of this species with long spikes.

4. **Æ. revoluta**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 92.

Suffruticosa incana parva ramis erectis complanatis; foliis obovatis obtusis alternis revolutis subtus incanis supra demum glabrescentibus; spicis oblongis brevibus ad extremitates ramorum spicatim dispositis; floribus haud nitidis; perianthii segmentis uninerviis bracteolis multo longioribus; staminodiis brevissimis deltoideis.

Suffrutex parvus basi lignosus a collo ramosus ramis erectis patentibus 1–2-pedalibus angulatis complanatis dense incanis. *Folia* petiolata 1–1¼ poll. longa $\frac{5}{12}$–$\frac{2}{3}$ poll. lata alternata obovata basi attenuata apice obtusa sæpe emarginata margine revoluta subcrenulata crassiuscula subtus incana nervo medio prominente supra sulcata primum subtiliter arachnoideo-pubescentia canescentia demum glabrata. *Spicæ* ½ poll. longæ ⅕ poll. latæ oblongæ ad extremitates ramorum spicatim singillatim v. 2–4-natim dispositæ inflorescentiamque compositam sæpe subpaniculatam formantes. *Flores* albescentes haud nitidi. *Bracteolæ* late ovatæ subacutæ concavæ perianthii segmentis multo breviores. *Perianthii* segmenta late ovata obscure carinata submucronata basi subincrassata exteriora villosa interiora minora uninervia. *Stamina* 5, filamentis basi dilatatis cupula longioribus; antheræ suborbiculares; staminodia brevissima subdeltoidea. *Ovarium* subglobosum; stylus apice capitatus obsolete bilobatus. *Utriculus* globosus. *Semen* fuscum $\frac{1}{16}$ poll. diam.

Nom. Vern. 'Feh (B.C.S.).

Socotra. On the Haghier range at considerable elevation. B.C.S. n. 478. Schweinf. n. 558.

Distrib. Endemic.

A very distinct species easily separated from all others by its foliage and habit. Its position in the genus is probably near *Æ. microphylla*, Moq.

6. ACHYRANTHES.

Achyranthes, Linn. Gen. n. 288; Benth. et Hook. Gen. Pl. iii. 35.

A small genus including species some of which are spread as weeds all over the tropics and warm regions of the globe.

A. aspera, Linn. Sp. 295; Moq. in DC. Prod. xiii. 2, 314; Ach. Rich. Tent. Flor. Abyss. ii. 215; Aschs. in Schweinf. Flor. Æthiop. 172; Boiss. Flor. Orient. iv. 993, excl. var.; Wight Ic. t. 1777.

Socotra. Common near habitations. B.C.S. 620.

Distrib. Spread over the world.

var. **sicula**, Linn. *loc. cit.*; Aschs. *loc. cit.*

A. argentea, Lamk. Encyc. i. 545; Moq. *loc. cit.* 315; Sibth. Flor. Græc. t. 244.
A. aspera, Linn. var. *argentea*, Boiss. *loc. cit.*

Socotra. Common on the plains. B.C.S. nn. 39, 625.

Distrib. Chiefly in Africa and south Europe.

Order LXII. CHENOPODIACEÆ.

A considerable family spread over the whole world, but most common in maritime and salt regions. Three genera are represented in Socotra, all of them of wide distribution over the globe.

1. CHENOPODIUM.

Chenopodium, Linn. Gen. n. 309; Benth. et Hook. Gen. Pl. iii. 51.

A considerable genus including many weeds of cultivation widely spread, chiefly in temperate regions, more rare in the tropics.

C. murale, Linn. Sp. 318; Moq. in DC. Prod. xiii. 2, 69; Ach. Rich. Tent. Flor. Abyss. ii. 220; Boiss. Flor. Orient. iv. 902; Flor. Dan. t. 2048.

Nom. Vern. Agalazi (B.C.S.).

Socotra. Near Galonsir. B.C.S. n. 62

Distrib. Cosmopolitan weed.

2. ATRIPLEX.

Atriplex, Linn. Gen. n. 1153; Benth. et Hook. Gen. Pl. iii. 53.

A large genus of mostly littoral plants very variable in character, inhabiting temperate and tropical regions of the globe.

A. Stocksii, Boiss. Diagn. ser. ii. 4, 73.

A. Griffithii, Moq. in DC. Prod. xiii. 102, var. *Stocksii*, Boiss. Flor. Orient. iv. 916.

Socotra. On Kadhab plain near Khor Hadjin. B.C.S. n. 264.

Distrib. Beloochistan, Scindh, and Persia.

Boissier who founded this species upon specimens gathered by Stocks in Beloochistan and Scindh, and by Aucher Eloy in Persia, has more recently sunk it as a variety of *A. Griffithii*, Moq. But this appears to me quite unnatural. The bracts in fruit of *A. Griffithii*, are almost orbicular with very conspicuous raised veins, and are nearly twice the size of those in *A. Stocksii;* and the leaves are large and quite entire. The Scindh plant, which is the only one I have seen, does vary somewhat in foliage, but the fruits are uniform in shape, being more cordate or cordate-reniform. Our Socotran plant resembles most nearly Stock's specimen from Scindh, n. 452, in Kew Herbarium. It is noteworthy on account of the very crisped condition of the leaves and the prominent much-fruited spikes. Possibly when we know more about them, other apparent specific forms, as *A. persicum*, Boiss., may be joined with this one, or this and the several allied forms may prove varieties of the better known European and Mediterranean *A. Halimus*, Linn. (Sp. 1492).

The plant is not common on the island. We only found it at one locality.

SUÆDA.

Suæda, Forsk. Fl. Ægypt. Arab. 69, t. 18, B; Benth. et Hook. Gen. Pl. iii. 66.

A small genus of plants inhabiting the salt plains and shore districts of both the old and new world.

S. monoica, Forsk. Fl. Ægypt. Arab. 70; Moq. in DC. Prod. xiii. 2, 156; Boiss. Flor. Orient. iv. 940.

Socotra. Common at many places on the shores. B.C.S. nn. 356, 363, 618, 619.

Distrib. North-east Africa to Arabia and India.

Like most succulent maritime plants this species shows a tendency to tumidity and the formation of tumours on stems and leaves. On Socotra this tendency is very marked in several places.

Order LXIII. POLYGONACEÆ.

A large family found in every part of the globe.

POLYGONUM.

Polygonum, Linn. Gen. n. 495; Benth. et Hook. Gen. Pl. iii. 97.

A very large genus spread over the whole world and containing several almost cosmopolitan weeds. Two well-known species are Socotran.

1. P. (Persicaria) **glabrum**, Willd. Sp. ii. 447; Meisn. Monog. Polyg. 78, and in DC. Prod. xiv. 114; Ach. Rich. Tent. Flor. Abyss. ii. 226; Wight Ic. t. 1799.

Socotra. B.C.S. n. 648.

Distrib. Tropics of both old and new world.

2. **P.** (Persicaria) **barbatum,** Linn. Sp. 518; Meisn. Monog. Polyg. 80, and in DC. Prod. xiv. 104; Ach. Rich. Tent. Flor. Abyss. ii. 226.

Socotra. B.C.S. n. 628.

Distrib. Tropics of Africa and Asia and in Australia.

The Socotran specimens are not so hairy on the back of the stipules as is typical.

Order LXIV. ARISTOLOCHIACEÆ.

A small order widely-dispersed in temperate and warmer regions especially of the northern hemisphere.

ARISTOLOCHIA.

Aristolochia, Linn. Gen. n. 1022; Benth. et Hook. Gen. Pl. iii. 123.

The largest genus of the order and with its distribution.

Aristolochia sp.

Socotra. On cliffs south-west from Galonsir. B.C.S. n. 641.

There is a small fragment of an *Aristolochia* in our collection but not sufficient for identification or description. I saw only one straggling plant in the locality mentioned from which I pulled the only twig bearing leaves and two flowers visible. I looked carefully in other places but never found the plant again.

Order LXV. PIPERACEÆ.*

A large order widely-spread over both old and new worlds, most abundant in warmer regions.

PEPEROMIA.

Peperomia, Ruiz et Pav. Flor. Per. et Chil. 1. 29, t. 44 ad 52; Benth. et Hook. Gen. Pl. iii. 132.

A considerable genus of the warmer regions of the globe, attaining a maximum development in America. There are three forms in Socotra. One is the Himalayan and Ceylon type of a widely-spread plant; another is found in Arabia, Madagascar, and the Cape, and the third is apparently a Bourbon species.

P. arabica, Dcne. in Miq. Syst. Piper. 121, and in Miq. Illustr. 18, t. 12; Cas. DC. in DC. Prod. xvi. i. 442.

* I am indebted to M. Casimir de Candolle for the identification of the third species here mentioned.

Socotra. On the Haghier hills. B.C.S. n. 723. Schweinf. in lit.

Distrib. Arabia, Madagascar, and Cape of Good Hope.

Living specimens of this brought by us to this country flowered at Kew in 1881.

P. reflexa, A. Dietr. Sp. v. 1, 180; Miq. Syst. Piper. 169; Cas. DC. in DC. Prod. xvi. 1, 451; Wight Ic. t. 1923,

var. **parvifolia,** Cas. DC. *loc. cit.*

Socotra. Occasional. B.C.S. n. 721. Schweinf. n. 792.

Distrib. Of the species,—widely spread in the tropics. Of the variety,—Ceylon, Eastern Himalayan.

3. P. Goudotii, Miq. Syst. Piper. 133; Cas. DC. in Linnæa xxxvii. (1871-73), 390.

Forma foliis feri orbicularibus brevius pubescentibus.

Socotra. On Haghier. B.C.S. n. 722. Schweinf. n. 791.

Distrib. Bourbon.

We have some imperfect specimens which M. Casimir de Candolle considers may be a form of this species.

Order LXVI. THYMELÆACEÆ.

A considerable family represented in most parts of the globe.

LASIOSIPHON.

Lasiosiphon, Fresen. in Flora 1838, 602; Benth. et Hook. Gen. Pl. iii. 197.

A small genus chiefly represented in south Africa, but occurring also in tropical Africa, Madagascar, and tropical Asia. Our solitary endemic Socotran species necessitates an emendation in the generic character to allow of the admission of species without any scales on the throat of the perianth.

L. socótranus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 92. Tab. LXXXVI.

Fruticosus glaber; foliis obovatis v. oblanceolatis glaucis; bracteis involucri coriaceis glabris latis; calycis fauce esquamato.

Frutex multiramosus glaber dense foliis vestita. *Folia* copiosa brevissime petiolata $\frac{3}{4}$–$1\frac{1}{2}$ poll. longa $\frac{1}{4}$–$\frac{1}{3}$ poll. lata anguste obovata v. oblanceolata obtusa cum acumine v. cuspidata deorsum gradatim attenuata crassiuscula nervo medio subtus prominente margine parum incrassato-revoluta glauca glabra læto-viridia; petiolus $\frac{1}{18}$ poll. longus. *Capitula* solitaria terminalia pedunculata (pedunculo $\frac{1}{2}$–1 poll. longo) e foliis supremis exserta in alabastro globosa; involucri folia 5 $\frac{1}{3}$ poll. longa inæqualia extima minima late ovata v. reniformi-cordata obtusa latitudine longitudinem excedente coriacea glabra; receptaculum hemisphæricum pilis albis brevibus vestitum. *Flores* in quoque capitulo circa 20. *Calyx* $\frac{1}{2}$ poll. longus crassus citrinus 5-fidus extus sericeo-pubescens intus glaber, tubo cylindraceo

fauce nuda, lobis $\frac{1}{5}$ poll. longis oblongo-obtusis. *Stamina* 10, 5 lobis calycis opposita fauci inserta, 5 lobis calycis alternantia medio tubi affixa. *Ovarium* sessile curvatum; stylus tubo calycis dimidio brevior sursum dilatatus, stigmate fimbriato.

NOM. VERN. Lēgief (Schweinf.).

Socotra. A not uncommon shrub. B.C.S. n. 518. Schweinf. n. 567. Hunter nn. 7, 12.

DISTRIB. Endemic.

Quite a distinct species in this genus, and interesting because of its variation from the generic type. The presence or absence of scales on the throat of the perianth is a character in this family which readily enables us to arrange many of the genera in groups. *Lasiosiphon* belongs to the group in which scales are commonly present, and in all hitherto described species these are developed. But in our Socotran plant there are none. At first their absence led me to regard the plant as probably an *Arthrosolen;* but its features are thoroughly those of *Lasiosiphon*, its position in the genus being in the vicinity of *L. glaucus*, Fresen. (in Flora 1838, 603; Meisn. in DC. Prod. xiv. 593), a tropical African species, and of the Mascarene *L. Bojerianus*, Dcne. (in Jacquem. Voy. Bot. 149; Meisn. *loc. cit.* 597).

In Kew Herbarium I find two specimens collected in east Africa by Hildebrandt. They are undescribed. One, n. 2838, is labelled "Kitui in Ukamba, frutex 2^m alt.," the other is n. 2369, and has the label "Wildness zwischen Duruma u. Teita (u. i. Ndara), frutex 2^m alt. ram. striat., fl. aurant." These are of the same species, and it is unquestionably nearly allied to the Socotran plant, in fact is its nearest ally, distinguished, however, by the slightly pilose leaves and the oblong silky involucral bracts. It is noteworthy that in the flowers of this species, the scales of the perianth are absent as in the Socotran plant.

Order LXVII. LORANTHACEÆ.

A small order of commonly parasitic plants widely dispersed in tropical regions, rarer in extratropical countries.

LORANTHUS.

Loranthus, Linn. Gen. n. 443; Benth. et Hook. Gen. Pl. iii. 207.

A large genus constituting the major part of the order, widely dispersed over the globe, and most abundant in the tropics.

Loranthus sp.

We have twigs of a species of *Loranthus* but no flowers, and the specimens are not sufficient for identification or complete determination. The plant resembles somewhat *L. oblongifolius*, E. Mey. (in herb. Schimp. Abyss. sect. ii.

n 768; Ach. Rich. Tent. Flor. Abyss. i. 342), but is not conspecific. The following is a brief indication of characters derived from our fragments:—

Ramuli glabri glauci striati. Folia breviter petiolata elliptica v. elliptico-oblonga v. oblonga obtusa basi contracta 2-2¼ poll. longa 1–1¼ poll. lata valde coriacea venulis a basi sursum divergentibus; petiolus validus ¼ poll. longus.

Socotra. Near Galonsir. B.C.S. n. 195.

Order LXVIII. SANTALACEÆ.

A considerable order of tropical and temperate woody plants, sometimes parasitical, spread all over the world. The Socotran members of the order belong to old world genera.

OSYRIS.

Osyris, Linn. Gen. n. 1101; Benth. et Hook. Gen. Pl. iii. 227.

A small genus of glabrous often glaucous shrubs or small trees, natives of south Europe, Africa, and India. One Socotran species has a wide distribution in Africa and India; the other is endemic.

1. O. arborea, Wall. Cat. n. 4035; A. DC. Prod. xiv. 633.

O. Wightiana, Wall. Cat. n. 4036; A. DC. *loc. cit*; Wight Ic. t. 1853.

O. abyssinica, Hochst. in herb. Schimp. Abyss. sect. i. n. 281; Ach. Rich. Tent. Flor. Abyss. ii. 236; A. DC. *loc. cit.*

Socotra. On the Haghier range at altitudes over 1500 feet. B.C.S. n. 503. Schweinf. n. 730.

Distrib. India and Africa from Abyssinia to the Cape.

The name adopted here for this species was originally given by Wallich to Nepal plants. But I cannot find specific differences betwixt the Nepal plants and those widely-spread (in India and Ceylon) species which he named *O. Wightiana*. I also take the African plant *O. Abyssinica* of Hochstetter to be a form of the same species; and retaining the oldest name for the species, we find it a widely-spread form throughout India and Africa. It is not a little variable in size and form of leaf. Our Socotran plants have broad and very glaucous leaves resembling in this particular the Indian *O. Wightiana*. Of the flowers we have only a few males, but they give no ground for separation from this species.

2. O. pendula, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 93. Tab. LXXXVII.

Arborea glabra ramis pendulis; foliis breviter petiolatis alternis lanceolatis v. suboblanceolatis acutis glaucis; floribus dioicis; ♂ dimorphicis in cymas 3–4-floras longe pedunculatas dispositis, plurimis minutis perianthio rotato 3–4-lobato discoque carnoso, paucis majoribus pyriformibus lobis conniventibus; ♀ ign.

Arbor parva glabra ramis multiramosis ultimis tenuibus pendulis angulatis compressis. *Folia* alterna $\frac{3}{4}$–1 poll. longa $\frac{1}{3}$–$\frac{1}{2}$ poll. lata petiolata lanceolata v. elliptico-oblonga v. suboblanceolata v. anguste obovata acuta basi attenuata integra parum revoluta crassiuscula glauca subtus nervo medio prominente; petiolus $\frac{1}{6}$–$\frac{1}{5}$ poll. longus. *Flores* dioici; ♀ ignoti; ♂ in cymas axillares foliis subtendentibus subæquales v. longiores 3- (rarius 4-) floras longe pedunculatas ad extremitates ramulorum dispositi; pedunculi $\frac{5}{12}$–$\frac{1}{2}$ poll. longi; cymæ quæque flos centralis solum aperiens et longissime pedicellatus, laterales caduci; bracteolæ lineares v. sublanceolatæ rubro-punctatæ caducæ $\frac{1}{12}$ poll. longæ. *Flores* ♂ dimorphici: plurimi minuti crassiusculi glauci in alabastro trigono- v. tetragono-globosi $\frac{3}{16}$ poll. diam. pedicelloque $\frac{1}{6}$ poll. longo; perianthio subrotato alte 3–4-lobato expanso $\frac{1}{6}$ poll. diam., lobis ovato-rotundatis obtusis; disco obscure 3–4-lobato carnoso; staminibus 3–4 inflexis lobis oppositis eisque brevioribus, antherarum loculis parallelis filamentis subæqualibus: pauci majores et sæpissime ad basin inflorescentiæ totæ pyriformes v. obovoidei $\frac{1}{5}$ poll. longi $\frac{1}{12}$ poll. diam., pedicello incrassato $\frac{1}{8}$ poll. longo; perianthio coriaceo incrassato glauco levi 3-lobato lobis alte connatis intus spongioso demum aperiente; staminibus 3, antheris pollinibusque majoribus. Cæt. ignot.

Socotra. On the Haghier hills. B.C.S. n. 630.

Distrib. Endemic.

A very graceful plant; quite distinct from, though allied to, other species. We have no female flowers of the plant, but the male flowers present an interesting feature deserving special mention. The majority of the flowers are small with somewhat rotate perianths as in other species of the genus. The stamens in these flowers are perfect, the anthers splitting laterally and discharging a granular smooth pollen when the corolla opens. But in addition to these normal flowers there is another kind. They are more sparingly developed and usually at some distance from the apex of the flower-bearing branch. They are much longer and have with their pedicels a pear-shape. As in the case of the other kind of male flower, it is commonly the centre flower only of each cyme which develops and opens, the lateral ones falling off, and these solitary pyriform flowers on long peduncles become thus conspicuous, and might at first be taken for fruits. The pedicel is thickened, and gradually blends with the floral perianth, which is greatly hardened and thickened and divided slightly into three lobes, which, however, remain connate and connivent for a long time, and thus the perianth forms a box of an obovoid shape. The inner surface of the perianth is somewhat spongy, and bears three stamens on short filaments. The anthers are normal in form, larger than those in the small male flowers, and contain smooth pollen grains, which are larger than the grains of the smaller flowers. When mature these flowers open slightly but do not expand freely; they merely form a chink at the apex. Of what service this dimorphism is to the plant it is difficult to say, in the absence of specimens to show the character of the female flowers, in which one would possibly find a corresponding dimorphism. In no specimens of other species in Kew Herbarium have I been able to find a like condition.

THESIDIUM.

Thesidium, Sond. in Flora 1857, 364; Benth. et Hook. Gen. Pl. iii. 222.

A small south African genus.

Thesidium sp.?

Suffrutex nanus lignosus cortice griseo intricato- et breviter ramosus ramis terminalibus albidis subnitidis puberulis. *Folia* sessilia crassa minuta sub ½ poll. longa ad ramulos laterales contractos imbricata deltoidea cordata amplexicaulia canescentia antice concava postice convexa carinata margine submembranacea. *Flores* ♀? solitarii sessiles ad extremitates ramulorum contractorum lageniformi ⅓ poll. longi. *Perianthium* 5-lobatum, lobis connatis apice obtusis inflexis conniventibus extus canescentibus. *Staminodia* 5 basi connata apice membranacea linearia. *Ovarium*? subclavatum 5-alatum staminodiis æquilongum. Cæt. ignot.

Socotra. On Kadhab plain. B.C.S. n. 359.

A small woody undershrub we have doubtfully referred to this Santalaceous genus. Its habit is quite that of other species in the genus, but unfortunately the two or three flowers on our specimens have been attacked by a grub, and the internal structure is undeterminable, so that it is not possible to give an accurate diagnosis, and to fix its position clearly. The plant is a very characteristic plain form.

Order LXIX. EUPHORBIACEÆ.

A vast order represented in all parts of the globe. Twelve genera have representatives in Socotra, and of them, eight are found more or less all over the world, though two attain a maximum in America. Three are more peculiarly old world types of some range, whilst one is a small tropical African genus.

1. EUPHORBIA.

Euphorbia, Linn. Gen. n. 609; Benth. et Hook. Gen. Pl. iii. 258.

A vast genus having representatives in all parts of the globe. Ten species occur in Socotra. Of these, one is a Mediterranean and north African species, two are north-east African and south-west Asiatic, and seven are endemic.

1. E. (Anisophyllum) **indica**, Lamk. Encyc. ii. 423; Boiss. in DC. Prod. xv. 2, 22, and Flor. Orient. iv. 1086.

E. ægyptiaca, Boiss. Cent. Euph. 13, and in DC. Prod. xv. 2, 35, and Flor. Orient. iv. 1088; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 34.

E. hypericifolia, Ach. Rich. Tent. Flor. Abyss. ii. 243 (non. Linn.).

Socotra. Near Tamarida and Galonsir. Common. B.C.S. n. 642. Schweinf. n. 300.

Distrib. From Cape de Verde islands through tropical Africa and south-west Asia to northern India.

2. **E.** (Anisophyllum) **Chamæsyce**, Linn. Amœn. Acad. iii. 115; Boiss. in DC. Prod. xv. 2, 34, and Flor. Orient. iv. 1088; Sibth. Flor. Græc. t. 461.

Socotra. In many places. B.C.S. n. 78, 643. Schweinf. n. 796.

Distrib. Mediterranean region of Europe and north Africa.

The discovery of this species in Socotra extends its distribution considerably farther eastwards.

In Socotra the plant varies much in indumentum and involucral appendages. Schweinfurth's specimens are nearly glabrous, and the appendages to the involucral segments are merely erose. But in our plants the foliage is much smaller and over all hoarily pubescent, and the involucre appendages are longly and deeply fringed.

3. **E.** (Anisophyllum) **leptoclada**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Fruticosa ramulis ultimis delicatulis articulatis glabris; foliis omnibus oppositis parvis petiolatis ellipticis; capitulis minutis terminalibus solitariis pedicellatis; involucri glandulis inappendiculatis; staminibus paucis.

Frutex copiose ramosus ramulis ultimis capillaribus rectis v. subanfractuosis internodiis elongatis glabris. *Folia* $\frac{1}{3}$–$\frac{3}{8}$ poll. longa $\frac{1}{6}$ poll. lata breviter petiolata elliptica v. nonnunquam obovata paulum obliqua obtusa integerrima supra viridia subtus pallidiora; petiolus vix $\frac{1}{12}$ poll. longus. *Stipulæ* minutissimæ. *Capitula* solitaria terminalia breviter pedicellata; pedicellus $\frac{1}{12}$ poll. longus. *Involucrum* $\frac{1}{24}$ poll. longum campanulatum extus glabrum intus villosum; bracteæ ovato-acutæ villosæ; glandulæ 4 glabræ subrotundatæ stipitatæ. *Stamina* pauca. *Floris* fœminei pedicellus elongatus. Cæt. ignot.

Socotra. Above Kischen at an elevation over 2700 feet. Schweinf. 615 in part.

Distrib. Endemic.

Imperfect specimens of a *Euphorbia*, I find in Schweinfurth's collection mixed with specimens of *Phyllanthus filipes*, Balf. fil. (see page 270), which I have described here as a new species. It is apparently referable to the *Anisophyllum* section, but it differs from the majority of species in that section by its habit.

4. **E.** (Eremophyton) **socotrana**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 93. Tab. LXXXVIII.

Arborea glabra; foliis magnis breviter petiolatis late obovatis apiculatis; capitulis magnis solitariis terminalibus; involucro glabro, bracteis fimbriatis; glandulis 6; staminibus paucis; capsulis seminibusque pulverulentibus.

Arbor glabra 20-pedalis dichotome ramosa trunco elevato cortice atro-brunneo nitido, ramis ultimis validis ad extremitates foliis facile detersis arcte vestitis et sub foliis cicatricosis. *Folia* $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa 1–$1\frac{1}{4}$ poll. lata alterna breviter petiolata plus minusve obovata sæpe late obovata v. subelliptica apice rotundata integra v. truncata et emarginata rarius acuta apiculata basi nunc anguste nunc late obtuse attenuata margine integra subrevoluta coriacea glauca pennivenia nervo medio prominente primariis sæpe rubescentibus; petiolus

$\frac{1}{8}$–$\frac{1}{4}$ poll. longus canaliculatus basi dilatatus. *Stipulæ* nullæ. *Capitula* conica magna $\frac{5}{6}$ poll. diam. breviter pedunculata ad extremitates ramulorum solitaria; pedunculus $\frac{1}{8}$ poll. longus validus; bracteæ pedunculares ovatæ acutæ squamiformes. *Involucri* bracteæ rotundatæ acute fimbriatæ inflexæ; glandulæ 6 inæquales transverse oblongæ $\frac{1}{5}$ poll. longæ parum concavæ carnosæ leviter reflexæ; bracteolæ interflorales plurimæ magnæ expansæ laceræ pedicello staminum æquilongæ; receptaculum pyramido-conicum glabrum. *Staminum* pedicelli $\frac{1}{8}$ poll. longi; filamenta brevia crassa; antherarum loculi oblongi basi divergentes. *Ovarium* solitarium glabrum subturbinatum subsessile; styli vix ad medium coaliti segmentis breviter bifidis reflexis. *Capsula* fusco-pulverulenta $\frac{1}{2}$ poll. longa plus minus sulcata. *Semina* pulverulenta $\frac{1}{3}$ poll. longa.

NOM. VERN. Dugush (B.C.S.). Duggei (Schweinf.).

Socotra. On the slopes of the hills on both sides of the island. B.C.S. n. 464. Schweinf. n. 531. Hunter n. 13.

DISTRIB. Endemic.

A fine new species growing in several places on the hill slopes of Haghier, and also in the valleys on the south side of the island.

It has no near alliance with any other species in the section.

5. E. (Tirucalli) obcordata, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 93.

Fruticosa ramis juvenilibus puberulis; foliis breviter petiolatis late obovatis v. obcordatis crassiusculis; cymis solitariis terminalibus 3-cephalis; involucro extus pubescente, bracteis fimbriatis, glandulis rubris; staminibus paucis.

Frutex parvus nonspinescens noncarnosus resiniferus multo breviterque ramosus cortice griseo glabro, ramis baseis ramulorum demissorum tuberculatis, juvenilibus pulverulento-tomentellis angulatis. *Folia* 1–1$\frac{1}{4}$ poll. longa $\frac{1}{2}$–1 poll. lata breviter petiolata ad ramulos breves disposita alterna exstipulata obcordata v. late obovata apice rotundata v. subtruncata retusa v. fere subbilobata rarius minute apiculata inferne in petiolum gradatim attenuata integra v. obscure subcrenulata crassiuscula subtiliter puberula subtus parum pallidiora nervo medio prominulo; petiolus $\frac{1}{8}$–$\frac{1}{6}$ poll. longus basi incrassatus. *Cymæ* 3-cephalæ solitariæ ramulos floriferos terminantes basi duobus oppositis bracteis late obovatis minutis $\frac{1}{6}$ poll. longis pubescentibus cinctæ; capitula subsessilia v. brevissime pedunculata, centrale plerumque solum expensum. *Involucrum* $\frac{1}{8}$ poll. longum campanulatum carnosum extus pubescens intus villosum; bracteæ rotundato-ovatæ fimbriatæ; glandulæ 5 rubræ glabræ transverse ellipticæ. *Stamina* pauca. Cæt. ignot.

Socotra. On the hills in rocky places near Galonsir. B.C.S. n. 268.

DISTRIB. Endemic.

A species referable to Boissier's section *Lyciopsis* which includes but one Arabian species *E. cuneata*, Vahl (Symb. ii. 53; Boiss. in DC. Prod. xv. 2, 97; Jaub. et Spach Ill. Pl. Or. tt. 463, 464), one of the most frequent plants of Aden. Our Socotran plant is nearly allied to this species, like which it produces a gum-resin. But there are sufficient characters for distinction in the nonspiny habit, the absence of fasciculate leaves, the broader and more obovate leaves, and the smaller inflorescences of our plant. Our specimens are unfortunately imperfect, and do not show mature female flowers.

6. E. (Tirucalli) **Schweinfurthii**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Fruticosa ramis juvenilibus glabris; foliis sessilibus elongatis linearibus; cymis solitariis terminalibus monocephalis; involucro extus pubescente, bracteis fimbriatis, glandulis albis; staminibus paucis.

Frutex virgato-ramosus cortice rugoso ramorum internodiis elongatis, juvenilibus tetragonis. *Folia* omnia opposita sessilia v. subsessilia 1–1½ poll. longa $\frac{1}{12}$ poll. lata linearia obtusa basi abrupte contracta crassiuscula integerrima supra viridia margine erubescentia subtus pallidiora. *Stipulæ* minutæ ovatæ margine ciliatæ fuscæ. *Capitula* solitaria terminalia subsessilia v. brevissime pedicellata. *Involucrum* $\frac{1}{12}$ poll. longum campanulatum extus puberulum intus villosum; bracteæ minutæ fimbriatæ; glandulæ transverse ellipticæ margine lato albo. *Stamina* pauca. *Floris* fœminei pedicellus $\frac{1}{6}$ poll. longus. Cæt. ignot.

Socotra. Above Kischen at an altitude over 2500 feet. Schweinf. n. 650.

Distrib. Endemic.

A plant, of which Schweinfurth sends fragmentary specimens, I have described as a new species, not having been able to identify it with any known form. It appears to fall into the *Tirucalli* section of the genus somewhere in the vicinity of *E cuneata*, Vahl.

When describing the Socotran Asclepiadaceæ, I referred to some specimens which I took to be anomalous forms of *Ectadiopsis brevifolia*, the flowers exhibiting a marked phyllodia; and this *Euphorbia* of Schweinfurth's is not at all unlike these.

7. E. (Tirucalli) **oblanceolata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 93.

Suffruticosa ramis glabris; foliis subsessilibus oblanceolatis mucronulatis; umbellis cymosis terminalibus ramulis brevibus, bracteis magnis rotundatis; involucro extus glabro intus villoso, bracteis fimbriatis, glandulis flavis; capsulis glabris; seminibus tuberculatis.

Suffrutex parvus ramis longis teretibus cicatricosis subcrassis foliaque alterna numerosa facile detersa gerentibus glabris cortice griseo. *Folia* 1¼–2¼ poll. longa ⅓–½ poll. lata breviter petiolata v. subsessilia exstipulata oblanceolata v. longe obcuneata apice rotundata rarius acuta mucronata basi in petiolum brevem dilatatum attenuata integra coriacea supra obscure pulverulenta infra pallidiora glabra nervo medio inferne prominente. *Cymæ* in umbellas terminales ramosas 1 poll. diam. dispositæ cicatricibus bractearum ad nodos inferne conspicue notatas; rhachis brevis ¼ poll. longa; bracteæ late ovatæ v. rotundatæ sæpe mucronatæ $\frac{3}{10}$ poll. diam. albidæ puberulæ tenues venulosæ subtus nervo medio prominulo mox deciduæ; capitula subsessilia. *Involucrum* $\frac{1}{10}$ poll. longum campanulatum extus glabrum intus villosum; bracteæ rotundatæ fimbriatæ; glandulæ 5 transverse oblongæ flavæ margine involutæ glabræ. *Stamina* pauca, filamentis validis. *Ovarium* glabrum, stipite angulato; styli basi in columnam validam connati lobis bifidis. *Capsula* ⅕ poll. longa glabra trisulcata, coccis subcarinatis apice subacutis. *Semina* oblonga subtetragona omnino tuberculata grisea, carunculo magno albido.

Socotra. On the Haghier hills south from Tamarida. B.C.S. n. 639.

Distrib. Endemic.

A very interesting species, of the section *Tirucalli*, on account of its great

resemblance with the *E. daphnoides*, Balf. fil. (in Trans. Roy. Soc. 168, (extra vol.), 368) a plant endemic in Rodriguez. The affinity is very close, the specific diagnosis resting on the slightly smaller foliage, the much smaller cymose umbels with bracts and capitula also smaller, and these latter on very much shorter pedicels. It is apparently not common on Socotra, we only found it in one locality.

8. E. (Tirucalli) **Schimperi**, Presl. Bot. Bemerk. 109; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 34; Boiss. in DC. Prod. xv. 2, 96.

E. Larica, Boiss. Cent. Euph. 24, and in DC. Prod. xv. 2, 96, and Flor. Orient. iv. 1090.
Arthrothamnos Schimperi, Schweinf. in herb. Nub. n. 924.

NOM. VERN. Ägebah (B.C.S.). Eschba (Schweinf.).

Socotra. Common about Galonsir, Tamarida, and elsewhere. B.C.S. n. 292. Schweinf. nn. 526, 795. Hunter.

DISTRIB. Nubia, Arabia, and Persia.

In Schweinfurth's specimens, n. 795, the style is, as he remarks, much shorter in fruit than is typical.

9. E. (Tirucalli) **arbuscula**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 93. Tab. LXXXIX.

Arborea carnosa aphylla; cymis terminalibus sessilibus; involucri glandulis 5 concavis substipitatis; capsulis tomentosis: seminibus levibus carunculatis.

Suffruticosa alta v. arbor parva candelabriformis 20-pedalis carnosa plus minusve glauca ramis validis ultimis sæpe elongatis (6–7 poll.) teretibus v. subcomplanatis. *Folia* obsoleta ad squamas minutas deciduas reducta. *Capitula* ad extremitates ramulorum in cymas parvas sessiles dense conferta; bracteæ parvæ $\frac{1}{16}$ poll. longæ ovatæ v. rotundatæ glabræ nitidæ. *Involucrum* tenue $\frac{1}{12}$ poll. longum subglobosum extus tomentosum intus glabrum, bracteis obtusis tomentosis, glandulis transverse elongatis concavis glabris substipitatis stipite villoso. *Stamina* plurima, bracteolis interfloralibus membranaceo-fimbriatis. *Ovarium* non visum. *Capsula* $\frac{3}{10}$ poll. longa $\frac{1}{3}$ poll. lata tomentosa profunde trisulcata minute calyculata, pedicellis $\frac{1}{3}$ poll. longis validis, coccis carinatis apice rotundatis, stylis $\frac{1}{10}$ poll. longis. *Semina* fere globosa $\frac{1}{2}$ poll. diam. levia albida, carunculis nigris.

NOM. VERN. Emka (Schweinf.).

Socotra. Abundant. B.C.S. n. 207. Schweinf. nn. 241, 525.

DISTRIB. Endemic.

A distinct fleshy tree-Euphorbia with a dome-shaped crown, occurring abundantly on the plains and on the hills. It is interesting to find such an old type upon the island in view of the occurrence of a similar type and very nearly allied species *E. aphylla*, Brouss. (in Willd. Enum. i. 501; Boiss. in DC. Prod. xv. 2, 96), on the Canary Islands. In habit this species mimics the Dragon's blood tree.

On many parts of the hill regions of Socotra a fleshy tree-Euphorbia grows, which has much shorter and stouter branchlets than the one above described,

and it branches more irregularly. The floral structure is alike in both, but the fruit on specimens of the latter sent home by Schweinfurth is smaller, as is also the seed, and the style is shorter. I am not certain that it is possible to regard it as a distinct species, but it may be considered a variety, as,—

var. **montana**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Irregulariter ramosa ramis ultimis brevibus validis articulis brevibus; capsulis $\frac{1}{5}$ poll. longis $\frac{1}{4}$ poll. latis, pedicello $\frac{1}{4}$ poll. longo tenui, stylo brevi $\frac{1}{12}$ poll. longo; seminibus $\frac{1}{12}$ poll. longis.

Socotra. On the hills. B.C.S. n. 347. Schweinf. n. 643.

DISTRIB. Endemic.

10. **E.** (Diacanthium) **spiralis**, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Fruticosa carnosa candelabriformis a basi pauciramosa 1–2-pedalis, caule ramisque acute 5–7-angulatis sulcatis, angulis compressis subalatis spiraliter tortis rarius rectis lobatis lobis rotundatis parvis arcte positis, aculeis stipularibus binis brevibus $\frac{1}{6}$–$\frac{1}{5}$ poll. longis ab pulvino basali glauco divaricatis demum frequenter demissis, podariis distinctis.

Socotra. On the plains, not infrequent. B.C.S. n. 729.

DISTRIB. Endemic.

This plant appears to be a distinct species, but we have not material sufficient for a complete description. Several plants are now growing in this country, and ere long it may flower and enable us to determine its true character more accurately. One of its most distinctive features is the spiral twist on its stem and branches. From the Canary Islands and the dry plains of south and north Africa, several species with which our plant has some affinity are recorded.

2. BUXUS.

Buxus, Linn. Gen. n. 1053; Benth. et Hook. Gen. Pl. iii. 267.

A small genus, several species of which are inhabitants of temperate and mountain regions in the old world, one occurs in Madagascar, and one (the Socotran plant) is found in Somali Land. Other species are west Indian.

B. Hildebrandtii, Baill. Adans. xi. 268.

NOM. VERN. Mithan (B.C.S.). Kelle (Schweinf.). Metayne or Malarah (Wellst.).

Socotra. Abundant. B.C.S. n. 637. Schweinf. n. 415. Hunter.

DISTRIB. Somali Land.

This small tree is very abundant on the island, and the foliage exhibits a considerable range of variation. Sometimes the leaves are nearly orbicular, in other instances quite narrowly oblanceolate. The size of the fruit, too, varies much.

Young twigs of this species are used by the inhabitants for tooth sticks.

The wood is hard and compact. Schweinfurth brought home a quantity of it to test its value economically, but I have not learned the result of the trial.

Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 200) testifies to the hardness of the wood. He says, "the wood of a tree named Metayne or Malarah, which abounds in every part of the island, is so hard that our seamen used it for the same purposes as *lignum vitæ* is applied to, such as sheaves for blocks, splicing fids, &c."

3. PHYLLANTHUS.

Phyllanthus, Linn. Gen. n. 1050; Benth. et Hook. Gen. Pl. iii. 272.

A very large genus widely dispersed in the warmer regions of the globe. Of the three Socotran species one is endemic and the others are tropical African and south Asiatic.

1. P. (Paraphyllanthus) **maderaspatensis**, Linn. Sp. 1393; Müll. Arg. in DC. Prod. xv. 2, 362.

P. venosus, Hochst. in herb. Schimp. Abyss. sect. ii. 814; Ach. Rich. Tent. Flor. Abyss. ii. 254.
P. madraspatensis, var., Wight Ic. t. 1895, f. 3.
P. Thonningii, Schum. Beschr. Pl. Guin. 418.

Socotra. Common near Galonsir. B.C.S. n. 138. Schweinf. n. 715.

Distrib. From Cape de Verde islands through tropical and south Africa to the Indian Archipelago and Australia.

2. P. rotundifolius, Willd. Sp. iv. 584; Müll. Arg. in DC. Prod. xv. 2, 405; Boiss. Flor. Orient. iv. 1139,

var. **leucocalyx**, Müll. Arg. *loc. cit.*

P. Niruri, Ach. Rich. Tent. Flor. Abyss. 255 (non. Linn.).

Socotra. Near Galonsir. B.C.S. n. 636.

Distrib. Of the species,—through tropical Africa, south-west Asia, and India. The variety is tropical African.

3. P. filipes, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 94.

Suffruticosus ramis distichophyllis florigeris angulatis apicalibus; foliis oblongis, stipulis scariosis basi nonproductis; floribus monoicis paucis fasciculatis; staminibus 5, filamentis ad medium connatis, antherarum loculis contiguis; stylis 6; capsulis glabris trisulcatis longe filiformiter pedicellatis; seminibus scrobiculatis.

Suffrutex parvus vix pedalis ramulis rufis ultimis florigeris angulatis v. obscure alatis erectis glabris angulisque scabridis internodiis distinctis distichophyllis. *Folia* oblonga v. elliptico-oblonga $\frac{5}{12}$–$\frac{2}{3}$ poll. longa $\frac{1}{5}$–$\frac{1}{4}$ poll. lata breviter petiolata (petiolo $\frac{1}{8}$ poll. longo) apice mucronulata basi obtusa margine crenato-undulata glabra pennivenia. *Stipulæ* scariosæ ovato-lanceolatæ acuminatæ membranaceæ margine laceræ basi non productæ $\frac{1}{2}$ poll. longæ rufæ. *Flores* monoici in axillis fasciculati mares 2–3 fœminei plerumque 1 in fasciculo quoque; bracteæ ovatæ fimbriatæ. *Fl.* ♂ breviter pedicellati (pedicello $\frac{1}{24}$ poll. longo). *Perianthii* segmenta 5 $\frac{1}{16}$ poll. longa late elliptica v. subrotundata nervo medio herbaceo margine scariosa. *Stamina* 5, filamentis in columnam ad medium connatis supra liberis patentibus; antherarum loculi contigui. *Discus* urceolatus crenatus. *Fl.* ♀ pedicello $\frac{1}{12}$ poll. longo sub fructu $\frac{3}{8}$ poll. longo stricto capillari. *Perianthium* apertum

sub fructu $\frac{1}{8}$ poll. latum, segmentis ovatis obtusis. *Discus* urceolatus. *Styli* 6 recti breves divaricati. *Capsula* glabra $\frac{1}{10}$ poll. longa $\frac{1}{6}$ poll. diam. trisulcata apice depressa cicatricibus senis tuberculatis stylorum demissorum notata. *Semina* fusco-nigra reniformia lineato-scrobiculata et obscure strigosa.

Socotra. On the plains. Not common. B.C.S. n. 332. Schweinf. n. 615 in part.

Distrib. Endemic.

Appears to be a distinct species of the section *Euphyllanthus*. The long pedicels to the fruit and the six free styles are marked features.

4. SECURINEGA.

Securinega, Juss. Gen. 388; Benth. et Hook. Gen. Pl. iii. 275.

A small genus of branching shrubs distributed in tropical and temperate regions.

S. Schweinfurthii, Balf. fil. in Proc. Roy. Soc. Edin. xiii. (1883).

Fruticosa ramulis subtetragonis nonspinescentibus; foliis crassiusculis obovatis; pedicellis masculis solitariis.

Frutex ramosissimus ramis ultimis erectis strictis subvirgatis microphyllinis nonspinescentibus superne sæpe denudatis ramulos contractos laterales baseis foliorum demissorum et stipulis squamiformibus rugosos gerentibus. *Folia* ad ramulos contractos fasciculata sessilia parva $\frac{1}{4}$ poll. longa v. minora $\frac{1}{8}$ poll. lata obovata obtusa integerrima crassiuscula glabra. *Stipulæ* minutæ $\frac{1}{16}$ poll. longæ ovatæ rufæ. *Flores* masculi solitarii; pedicelli stricti erecti $\frac{1}{10}$ poll. longi. *Perianthii* segmenta $\frac{1}{12}$ poll. longa oblonga obtusa 3-nervia apice subcrenata. *Stamina* 5 ad medium connata superne divaricata. *Discus* 5-lobus lobis obovatis emarginatis. *Flos* fœmineus et fructus ignotus.

Socotra. Above Wadi Digal at an altitude of over 1500 feet. Schweinf. n. 562.

Distrib. Endemic.

Some imperfect specimens of a shrub sent by Schweinfurth I have taken as the type of the foregoing species. The plant is, as far as our specimens show, very closely allied to the south European *S.* (Colmeiroa) *buxifolia*, Müll. Arg. (in DC. Prod. xv. 2, 452), but is hardly conspecific, having more fleshy leaves and more shortly pedicellate flowers. Our specimens show only a few male flowers.

5. FLÜGGEA.

Flüggea, Willd. Sp. iv. 757; Benth. et Hook. Gen. Pl. iii. 276.

A very small genus widely-dispersed in the old world tropics. Both Socotran species have an extended distribution.

1. F. microcarpa, Blume Bijdr. 580.

F. obovata, and other synonyms Wall. Cat. n. 7928.

Securinega abyssinica, Ach. Rich. Tent. Flor. Abyss. ii. 256.

S. obovata, Müll. Arg. in DC. Prod. xv. 2, 449.

Phyllanthus polygamus, Hochst. in herb. Schimp. Abyss. sect. ii. n. 877, and sect. iii. n. 1698.

There are a vast number of additional synonyms, for which see Müller as quoted.

Socotra. Common. B.C.S. n. 495. Schweinf. n. 668.

Distrib. A very common plant in the tropical and subtropical regions of the old world.

2. **F. Leucopyrus**, Willd. Sp. iv. 757; Wight Ic. t. 1875.

Securinega Leucopyrus, Müll. Arg. in DC. Prod. xv. 2, 451.

Socotra. A not uncommon tree near Galonsir. B.C.S. n. 483.

Distrib. Widely spread in Tropical Asia.

6. JATROPHA.

Jatropha, Linn. Gen. n. 1084; Benth. et Hook. Gen. Pl. iii. 290.

A considerable genus of the warmer regions of the globe, but attaining a maximum of development in America.

J. (Adenoropium) **unicostata**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 94. Tab. XC.

Arbuscula resinifera; foliis lanceolatis v. oblanceolatis glaucis unicostatis; stipulis minutis glandulosis; floribus majusculis; staminibus 8; capsulis magnis glabris.

Frutex altus v. arbuscula resinifera ramis ultimis validis cortice cicatricibus magnis foliorum delapsorum notato. *Folia* ad extremitates ramulorum aggregata 4–6 poll. longa 1–2 poll. lata breviter petiolata lanceolata v. lata oblanceolata v. oblongo-elliptica rarius sublinearia et $\frac{1}{2}$ poll. lata versus extremitates ambos attenuata apice acutissima basi subcuneata margine obscure crenulato-undulata coriacea glabra opaca subglauca rufescente-venosa unicostata costa prominente pennivenia; petiolus $\frac{1}{4}$–$\frac{5}{6}$ poll. longus pulvino magno semilunato. *Stipulæ* minutæ inconspicuæ integræ. *Inflorescentiæ* in axillis foliorum supremorum cymoso-paniculatæ, pedunculo brevi $\frac{1}{2}$–1 poll. longo glabro valido angulato, ramulis primariis longis sæpe 2–3 poll., pedicellis brevibus $\frac{1}{6}$–$\frac{1}{2}$ poll. longis, bracteis $\frac{1}{3}$ poll. longis angustissimis apicaliter attenuatis subacerosis basi subcarinatis margineque inferne rubris glandulosis dentibus 2–3 instructis. Fl. ♂—*Calyx* alte 5-fidus, segmentis $\frac{1}{8}$ poll. longis ovato-lanceolatis obtusis glabris multinervosis. *Corolla* colorata, segmentis liberis $\frac{1}{3}$ poll. longis $\frac{1}{6}$ poll. latis oblongis retuso-truncatis glabris. *Discus* 5-lobatus lobis rubris carnosis globosis. *Stamina* 8, exteriora 5 breviora sed antheris majoribus, interiora 3, columna angulato-striata petalis dimidio breviore. Fl. ♀ major—*Calyx* alte 5-fidus, segmentis ovato-lanceolatis $\frac{3}{10}$ poll. longis. *Corollæ* segmenta $\frac{1}{2}$ poll. longa. *Styli* vix connati segmentis apice breviter 2-divisis. *Capsula* hexagona basi apiceque depressa glabra levia $\frac{1}{2}$–$\frac{2}{3}$ poll. diam. interdum glauca. *Semina* $\frac{1}{4}$–$\frac{1}{3}$ poll. longa.

Nom. Vern. Sibrha (Schweinf.).

Socotra. Abundant on the plains near Galonsir and elsewhere. B.C.S. nn. 13, 89, 137. Schweinf. nn. 256, 379. Perry. Hunter.

Distrib. Endemic.

An interesting species of the section *Adenoropium*, which contains most of the old world forms. It differs from the majority of species in its unicostate more or less lanceolate leaves. Specimens, not sufficient for complete description, were sent to Kew Herbarium some years ago by Wykeham Perry.

The plant yields a quantity of gum-resin, and the bark is used on the island for tanning.

One of our specimens, n. 13, is of a young seedling collected near Galonsir. It shows a great thickening on the primary stem at the collar, and the leaves are more longly petiolate than in the adult.

7. CROTON.

Croton, Linn. Gen. n. 1083; Benth. et Hook. Gen. Pl. iii. 293.

A vast genus of warmer regions of both worlds. Four species occur in Socotra, and all belong to the same section of the genus and are endemic.

1. C. (Eluteria) **sarocarpus**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 94. Tab. XCI.

Arbor; foliis ovatis penniveniis longe petiolatis lamina basi patellari-glandulosa subtus argenteo-lepidota; stipulis subulatis; inflorescentiis psuedoterminalibus; floribus dioicis; ♂ racemis multifloris, alabastris globosis, staminibus ultra 20; ♀ umbellis paucifloris, stylo bis bifido, capsula dense setigera, seminibus levibus.

Arbor 20-pedalis ramis rugosis verrucosis ultimis angulatis lepidotis. *Gemmæ* rufæ. *Folia* magnitudine valde ludentia plerumque 3-4 poll. longa nonnunquam 7 poll. 1–1½ poll. lata sed in exemplis maximis sæpe 3 poll. longe petiolata ovata v. elongato-ovata apice gradatim attenuata obtusa basi cordata v. rotundata v. subtruncata v. rarius late cuneata margine subrepanda coriacea pennivenia nervo medio subtus prominente supra pilis stellatis vestita subtus dense lepidota argentea albida nitida lepidibus plurimis parvis centro minute rubro-glanduloso margineque stellato-fimbriato albido sed paucis hinc inde distributis omnino fuscis centroque prominente rubro; petiolus plus minusve angulatus striatus lepidotus sub lamina glandulosus glandulis stipitatis umbilicatis 1–2½ poll. longus lamina parum brevior. *Stipulæ* minutæ subulatæ. *Fl.* in racemos multifloros breves terminales dispositi, pedicellis tenuibus 1–1¼ poll. longis lepidotis, bracteis inconspicuis. *Alabastri* globosi. *Calyx* ⅕ poll. longus 5-lobatus, lobis ovatis apice inflexis et incrassatis dorsaliter tomentoso-lepidotis lepidibus centro glanduloso-fuscis margine intus villosis. *Corollæ* petala membranacea ligulata nervo medio conspicuo margine ciliato-villosa revoluta apice recurva. *Stamina* exserta ultra 20. *Receptaculum* villosum. *Fl.* ♀ in cymas umbellatas paucifloras pseudoterminales conferti, rhachi angulata ½ poll. longa valida, pedicellis ¼ poll. longis dense lepidotis, bracteolis inconspicuis. *Sepala* 3 inæqualia non accrescentia. *Corollæ* petala anguste linearia lanceolata. *Stylus* bis dichotome divisus. *Fructus* ½–⅔ poll. longus dense setigerus setis validis $\frac{1}{12}$ poll. longis apice pilis penicellatis radiatim coronatis. *Semina* levia $\frac{3}{10}$ poll. longa carunculis fuscis transverse oblongis.

NOM. VERN. Mitra or Mittera. This vernacular name is apparently applied to all species of *Croton*.

Socotra. In many places on the hill slopes. B.C.S. nn. 298, 318, 640. Schweinf. nn. 517, 666.

Distrib. Endemic.

A distinct species of the section *Eluteria*. The dicœcism is one of its marked features, as this is not a common character in old world forms. The fruits, too, are remarkable on account of their thick clothing of bristles, each of which is topped by a pencil of radiating hairs.

As it occurs on the island it presents some variation. Some specimens (our n. 640, Schweinf. nn. 571, 666) belong to a large-leaved plant with their under surface densely scaly and silvery. On the other hand, our n. 298, and many portions of n. 318, show a much smaller-leaved form scarcely silvery underneath, though there are many stellate hairs. Although we have not female plants of all the specimens, yet I have little doubt of their conspecific nature.

2. C. (Eluteria) **sulcifructus**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 94. Tab. XCII.

Fruticosus; foliis ovatis penniveniis petiolatis lamina basi patellari-glandulosa subtus argenteo-lepidota; stipulis subulatis; glomerulis florium in spicas dispositis; fl. ♂ supremis subsessilibus, staminibus sub 20; fl. ♀ paucioribus basalibus pedicellatis, stylo bis bifido, capsula 6-sulcata lepidota lepidibus planis, seminibus levibus.

Frutex 10-pedalis cortice lenticellato rugoso subsuberoso. *Folia* $2\frac{1}{2}$–4 poll. longa 1–$1\frac{1}{2}$ poll. lata petiolata ovata acuta v. oblongo-elliptica obtusa basi plerumque rotundata sæpe subcordata v. late obtusa margine paulum undulata coriacea pennivenia nervo medio et venis primariis subtus prominentibus, pagina superiore canescente lepidibus minutissimis rotundatis centro rubris margine fimbriatis instructa, inferiore argentea dense lepidota lepidibus uniformibus centro subflaveis rarius paucis majoribus rufis suffulta; petiolus $\frac{3}{4}$–1 poll. longus angulatus canaliculatus uniformiter lepidotus sub lamina biglandulosus glandulis fulvis concavis stipitatis. *Stipulæ* subulatæ crassæ. *Flores* in glomerulos sessiles ad ramos lepidotos validos angulatos axillares spicatim dispositi, floribus in quoque glomerulo 3–4 sessilibus v. brevissime pedicellatis; bracteolæ minutæ subulatæ. *Fl.* ♂ plurimi in parte superiore spicarum aggregati. *Alabastri* globosi. *Calyx* 5-lobatus, lobis æqualibus ovatis acutis imbricatis corolla brevioribus. *Corollæ* lobi $\frac{1}{8}$ poll. longi late elliptici extus pubescentes intus basi villosi margine ciliato-villosi. *Stamina* sub 20, filamentis validis glanduliferis; autheræ antice tuberculatæ. *Disci* lobi rotundati conspicui. *Receptaculum* villosum. *Fl.* ♀ pauci ad basin spicarum dispositi. *Calyx* 5-lobatus, lobis ovatis intus sparsim strigosis extus stellatis adpressis pilis pubescentibus. *Corollæ* lobi subobovati v. elliptici obtusi extus stellatim tomentosi margine ciliato-villosi. *Ovarium* extus rufo-lepidotum; stylus bis bifidus ramis tuberculatis. *Capsula* $\frac{1}{3}$ poll. diam. valde 6-sulcata lepidoto-tomentosa pedicellata, pedicello $\frac{3}{10}$ poll. longo tetragono. *Semina* $\frac{1}{4}$ poll. longa levia apice canaliculata.

Nom. Vern. Mitra or Mittera.

Socotra. On the Haghier hills. B.C.S. nn. 484, 496. Schweinf. n. 621. Hunter.

Distrib. Endemic.

Another distinct species of this section easily distinguished from other Socotran forms by its inflorescence and fruit. Its nearest ally is probably *C. zambesicus*, Müll. Arg. (in Flora 1864, 483, and in DC. Prod. xv. 2, 515), a plant collected by Kirk near Senna in Zambesi Land. It is, however, quite a different plant.

3. **C.** (Eluteria) **elæagnoides**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 95.

Arboreus; foliis anguste ovatis penniveniis longe petiolatis lamina basi patellari-glandulosa subtus metallico-lepidota; stipulis inconspicuis: fl. ♂ ignotis; fl. ♀ in umbellas dispositi, stylo bifido, capsula lepidibus umbonatis dense vestita.

Arbor ramorum cortice lenticellato subsuberoso, ramulis juvenilibus angulatis tuberculato-lepidotis, lepidibus umbonatis umbone rufo margine breviter ciliato albido. *Folia* 1½–2 poll. longa ½–¾ poll. lata longe petiolata ovata v. ovato-lanceolata v. oblongo-ovata versus extremitates ambos attenuata apice obtusa basi late subcuneata obtusa margine obscure crenulato-undulata subinvoluta pennivenia medio nervo subtus prominente, pagina superiore canescente-viridi squamis rotundatis minutis centro rubro-glandulosis margineque albidis delicatim fimbriatis plus minusve tecta, inferiore nitida sub-metallica rufo-maculata squamis adpressis centro umbonatis rubris sed margine albidis stellatim ciliatis dense plurimisque squamis omnino rufis sparsim vestita; petiolus ⅔–¾ poll. longus canaliculatus lepidotus sub lamina glanduliferus glandulis stipitatis concavis. *Stipulæ* inconspicuæ. *Fl.* ♂ ignoti. *Fl.* ♀ in umbellas parvas pseudoterminales 6–12-floras dispositi; bracteolæ minutæ; pedicelli validi ½ poll. longi subcompressi maculato-lepidoti. *Calyx* ⅛ poll. longus alte 5-partitus, lobis ovato-ellipticis concavis subcarinatis imbricatis extus rufo-lepidotis margine tenuioribus intusque villosis. *Corollæ* lobi late elliptici v. fere rotundati interne margine villosi dorsaliter rufo-tuberculati. *Stylus* bis bifidus. *Fructus* immaturus subglobosus squamis adpressis umbonatis rotundatis margine stellatim fimbriatis vestitus.

Nom. Vern. Mitra or Mittera.

Socotra. On the Haghier hills. B.C.S. n. 492.

Distrib. Endemic.

Another species of this section having affinity with the south African *C. gratissimus*, Burch. (Trav. Afr. ii. 268; Müll. Arg. in DC. Prod, xv. 2, 516), and with the west African *C. amabilis*, Müll. Arg. (in Flora 1864, 537, and in DC. Prod. *loc. cit.*), but these are readily separated from it by the glabrous upper surface of their leaves as well as by other characters. Although we have imperfect specimens of our plant—neither fruit nor male flowers—there can be little doubt as to its position and novelty. It is possible that like the first described species it is diœcious.

4. **Croton** (Eluteria) **socotranus**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 95. Tab. XCIII.

Fruticosus; foliis penniveniis petiolatis ludentibus ab parvis ellipticis v. obovatis ad formas

oblongas ovatas variantibus lamina basi patellari-glandulosa, pagina utraque pilis stellatis sparsim vestita; stipulis obsoletis; floribus pedicellatis in umbellas unisexuales terminales dispositis; staminibus ultra 20; fœminei floris petalis linearibus; stylo bis bifido; capsula dense pilis setosis penicillatis vestita; seminibus levibus.

Frutex 10-pedalis v. minor bipartim rigide ramosus, ramis elongatis erectis cortice lenticellato griseo et subsuberoso terminalibus strictis sæpe virgatis angulatis rufo-lepidotis ramulos plurimos laterales contractos siccatricosos gerentibus. *Folia* ad extremitates ramulorum contractorum fasciculata forma magnitudine et petioli longitudine ludentia, in fruticibus parvis valide ramulosis camporum aridorum parva $\frac{1}{6}$–$\frac{1}{2}$ poll. longa $\frac{1}{8}$–$\frac{1}{6}$ poll. lata (petiolo incluso $\frac{1}{24}$–$\frac{1}{6}$ poll. longo) elliptica v. oblongo-elliptica v. obovata apice obtusa sæpe emarginata basi sensim attenuata margine integra v. obscure crenata et subinvoluta crassiuscula facile detersa, in fruticibus altioribus tenuius ramulosis locos gratos incolantibus majora 1–1$\frac{1}{2}$ poll. longa $\frac{1}{2}$ poll. lata (petiolo incluso sæpe 1 poll. longo) lanceolata v. anguste oblonga v. oblongo-ovata v. elongato-cordata nonnunquam inferne expansa et subhastata versus apicem attenuata obtusa basi plerumque subcuneata rarius rotundata margine integra v. distincte crenata tenuiora persistentiora, omnia pilis stellatis adpressis plus minusve sparsim utrinque vestita; petiolus albido-lepidotus et squamis rufis paucis etiam glandulis duabus stipitatis divaricatis sub lamina præditus. *Stipulæ* inconspicuæ. *Flores* in umbellas unisexuales ad extremitates ramulorum dispositi. *Fl.* ♂—*Umbellæ* multifloræ, bracteis squamiformibus, pedicellis $\frac{1}{4}$–$\frac{1}{3}$ poll. longis rufo-lepidotis. *Calyx* 5-partitus, lobis ovatis acutis intus nitidis margine pilosis extus lepidotis lepidibus rufis. *Corollæ* lobi calyce longiores oblongo-obovati angusti obtusi albidi membranacei margine villosi venulo medio conspicuo. *Stamina* ultra 20. *Disci* lobi rotundati. *Receptaculum* villosum. *Fl.* ♀—*Umbellæ* pauciflorae, bracteis ut in masculis, pedicellis $\frac{1}{5}$ poll. longis sub fructu auctis angulatis validis. *Calycis* lobi ut in masculis. *Corollæ* lobi reducti tenues lineares apice breviter expansi. *Discus* inconspicuus. *Stylus* bis bifidus, segmentis apice dilatatis. *Capsula* globosa $\frac{1}{3}$ poll. diam. villis pilorum rigidorum stellatim radiantium arcte vestita. *Semina* levia oblonga nitida $\frac{1}{5}$ poll. longa, carunculis magnis.

Nom. Vern. Mitra or Mittera.

Socotra. Very abundant on the plains and lower slopes of the hills. B.C.S. nn. 1, 278, 494. Schweinf. nn. 449, 798. Hunter.

Distrib. Endemic.

A fourth species of the *Eluteria* section, and very widely distinct from all species hitherto described. From the other insular forms the vestiture of its leaves and their much smaller size at once separate it. In the female flower the petals are greatly reduced, being merely narrow linear lobes. The fruit has somewhat the character of *C. sarocarpus*, but it is much smaller, and the brush-like surface is produced by sessile tufts of stiff hairs, not by pencils on the top of setæ.

This species is perhaps the commonest plant on the plains and lower hill-slopes, forming indeed almost the whole of the scrub covering these regions. It varies much both in habit and foliage with situation. The plain plants (B.C.S. n. 1, Schweinf. n. 998) are, as is to be expected, commonly more dwarf, or at anyrate have stout branches and small fascicled leaves; whilst in more favour-

able localities the branches are more slender and the leaves are larger with longer petioles.

The young seedling plants, of which our n. 494 is a specimen, have a silvery and scaly stem bearing many small deltoid leaves with crenate margins borne on long petioles.

The wood of this tree is very hard, and is much used for rack-pins, camel-saddles, &c.

8. CHROZOPHORA.

Chrozophora, Neck. Elem. Bot. ii. 337; Benth. et Hook. Gen. Pl. iii. 305.

A small genus of some six species, badly defined, extending from the Mediterranean region to tropical Asia and Africa. Both Socotran species are widely distributed.

1. **C. tinctoria**, Ad. Juss. Tent. Euph. 28; Müll. Arg. in DC. Prod. xv. 2, 748; Boiss. Flor. Orient. iv. 1140; Sibth. Flor. Græc. t. 950.

Socotra. Near Galonsir. B.C.S. n. 644.

Distrib. South Europe, north Africa, and south-west Asia.

2. **C. obliqua**, Ad. Juss. Tent. Euph. 28; Müll. Arg. in DC. Prod. xv. 2, 749; Boiss. Flor. Orient. iv. 1141; Schweinf. Pl. Nilot. t. 3.

C. oblongifolia, Ad. Juss. Tent. Euph. 28; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 36.
Croton oblongifolia, Delile Fl. Ægypt. 139, t. 51, f. 1.

Socotra. Near Galonsir and Tamarida. B.C.S. n. 133.

Distrib. From north-east Africa through south-west Asia to India.

Schweinfurth sends specimens of this with very narrow leaves, which he says is characteristic of a type confined to the shores of the Red Sea, and for it he proposes a varietal name,—

var. **frutescens**, Schweinf.: foliis angustis.

Socotra. Near Tamarida. Schweinf. n. 358.

Distrib. Shores of the Red Sea.

9. CEPHALOCROTON.

Cephalocroton, Hochst. in Flora 1841, 370; Benth. et Hook. Gen. Pl. iii. 307.

A genus of limited distribution including three species, two of which are tropical African and the third is Socotran.

The discovery of this genus in Socotra necessitates an extension of the generic character as given by Bentham and Hooker, so as to include species in which the sepals of the female flower are entire and not "lacero-pinnatifida," and in which the leaves are feather-veined.

C. socotranus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 95. Tab. XCIV.

Fructicosus; foliis ad extremitates ramulorum lateralium contractorum sæpe fasciculatis rotundatis v. obovatis subintegris penniveniis; fl. ♀ sepalis integris.

Frutex 10-pedalis lignosus ramulis terminalibus sæpe subvirgatis cortice levi fulvo-pulverulento proventu glabro, lateralibus contractis arcte cicatrosis. *Folia* ad ramos elongatos alternatim et remote disposita, ad contractos fasciculatim aggregata, in magnitudine et forma ludentia maxima 1¼ poll. longa 1 poll. lata minima ½ poll. longa ⅓ poll. lata breviter petiolata rotundata v. obovata v. elliptica v. oblongo-elliptica apice obtusa integra v. emarginata versus basin plerumque attenuata v. plus minusve rotundata margine integra obscure subundulata coriacea pennivenia venulosa venulis plus minusve rubescentibus, pagina superiore atra in juvenilibus pilis stellatis vestita in senioribus glabra, inferiore albida velutino-tomentosa squamellis paucis irregularibus substipitatis rubris venulas sparsim tegentibus; petiolus $\frac{1}{8}$—$\frac{3}{10}$ poll. longus fulvo-pulverulentus eglandulosus. *Stipulæ* obsoletæ. *Flores* in spicatim capitatas inflorescentias androgynas axillares ad extremitates ramulorum lateralium contractorum dispositi. *Fl.* ♂ supremi glomerulum globosum ⅓ poll. diam. multiflorum terminalem formantes, inflorescentiæ rhachi communi sub eis et supra fœmineos ½ poll. longa nuda valida angulata fulvo-pulverulenta, pedicellis ⅓ poll. longis, bracteolis inconspicuis rufis squamiformibus. *Calyx* 3-lobatus, lobis integris late ovatis acutis extus tomentosis intus nitidis. *Stamina* 7–9 exserta. *Ovarii* rudimentum oblongum trifidum basi pilosum. *Fl.* ♀ pauci ad basin inflorescentiæ totæ subsessiles v. brevissime pedicellati, pedicellis angulatis tomentosis, bracteolis ut in masculis. *Calyx* 6-lobatus, lobis integris obovatis v. subulatis crassis fulvo-tomentosis inæqualibus alternatim minoribus, majoribus ⅛ poll. longis. *Discus* obsoletus. *Ovarium* pulverulento-tomentosum trisulcatum; stylus fere ad basin trifidus segmentis multiramosis. *Capsula* extus glabra. *Semina* globosa ⅕ poll. longa nigra puberula.

Nom. Vern. Tehn. (B.C.S.). Than (Schweinf).

Socotra. In many places, both at great altitudes and also on the shore plains. B.C.S. nn. 391, 633. Schweinf. nn. 430, 594, 797.

Distrib. Endemic.

A very distinct plant, which falls naturally into this genus, though it differs much from the Mozambique and Nile Land species which hitherto constituted it. Altogether ours is a more compact and smaller leaved plant than these others, and the leaves are not dentate with broad 3–5-nerved bases. But the chief difference lies in the sepals of the female flowers which are entire.

Like so many Socotran plants this one exhibits large-leaved and small-leaved forms according to its situation, and has usually many shortened branches on which the leaves are fascicled.

10. ACALYPHA.

Acalypha, Linn. Gen. n. 1082; Benth. et Hook. Gen. Pl. iii. 311.

A vast genus of the warmer regions of the world, chiefly American.

A. indica, Linn. Sp. 1424; Müll. Arg. in DC. Prod. xv. 2, 868; Wight Ic. t. 877.

Socotra. Near villages. B.C.S. nn. 8, 19. Schweinf. n. 342.

Distrib. Widely spread in the old world tropics. Our specimen, n. 19, which is the same as Schweinfurth's n. 342, is a much more hairy plant throughout than the type, and the male spikes are short.

11. RICINUS.

Ricinus, Linn. Gen. n. 1085; Benth. et Hook. Gen. Pl. iii. 321.

A monotypic genus now found everywhere in warmer regions.

R. communis, Linn. Sp. 1430; Ach. Rich. Tent. Flor. Abyss. ii. 250; Müll. Arg. in DC. Prod. xv. 2, 1017; Boiss. Flor. Orient. iv. 1143.

Socotra. Near Galonsir. B.C.S. n. 29.

Distrib. Of the genus.

12. TRAGIA.

Tragia, Linn. Gen. n. 1048; Benth. et Hook. Gen. Pl. iii. 329.

A considerable genus of often twining or climbing stinging plants dispersed widely in the tropics, and also extending in some areas into subtropical zones.

T. (Tagira) dioica, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 95.

Volubilis dioicus; floribus masculis 3-meris; florum fœmineorum calycis lobis palmatim 5-fidis, stylo fere ad basin trifido segmentis revolutis.

Frutex late volubilis urentissimus caule tereti lignoso canescente, ramulis juvenilibus pilosis striatis. *Folia* 3–6 poll. longa $1\frac{1}{2}$–$2\frac{1}{2}$ poll. lata in exemplis majoribus interdum multo minora longe petiolata (petiolo sæpe $2\frac{1}{2}$ poll. longo) ovata v. oblongo-cordata v. triangulari-cordata acuta basi cordato-rotundata margine grosse dentata axillis dentium villoso-hispidis pilosa et urentibus pilis venulas obtegentibus pagina inferiori pallidiore. *Stipulæ* caducæ lanceolatæ longe acutæ extus pubescentes. ♂—*Spicæ* axillares 3–$4\frac{1}{2}$ poll. longæ multifloræ, bracteis lanceolatis v. lineari-lanceolatis acutis v. obtusis subconcavis extus pubescentibus, pedicellis $\frac{1}{8}$ poll. longis sparsim pilosis brevioribus v. subæquilongis; bracteolæ plerumque minutæ lanceolatæ $\frac{1}{24}$ poll. longæ. *Calycis* segmenta late ovata v. subobovata v. subrotundata apice abrupte attenuata basi lata. *Stamina* 3. *Ovarii* rudimentum 3-lobatum glanduloideum. ♀—*Spicæ* longæ floribus ad nodos subglomeratis pedicellatis, pedicellis sub fructu $\frac{1}{4}$ poll. longis, bracteis obovatis $\frac{1}{6}$ poll. longis $\frac{1}{8}$ poll. latis ciliato-hispidis. *Calyx* 5-6-lobatus accrescens sublignascens, lobis palmatim v. pedatim 5-laciniatis laciniis (centrali maxima) lineari-obtusis v. oblanceolatis rarius lacinulatis intus strigoso-pubescentibus extus hispidis. *Ovarium* hispidum. *Stylus* fere ad basim trifidus segmentis revolutis. *Capsula* hispida. *Semina* globosa $\frac{1}{6}$ poll. diam. areolato-marmorata.

Nom. Vern. Zafak (B.C.S.). Safága (Schweinf.).

Socotra. Common on the slopes of Haghier. B.C.S. nn. 366, 626. Schweinf. nn. 360, 479.

Distrib. Endemic.

A new species allied to *T. involucrata*, Jacq. (Ic. Rar. i. 18, t. 190; Müll. Arg. in DC. Prod. xv. 2, 943), an eastern species of considerable distribution, and also to the tropical African and Arabian *T. mitis*, Hochst. (in herb. Schimp. Abyss. sect. ii. n. 517; Müll. Arg. in DC. Prod. xv. 2, 942), but marked out from these and other species by its dicœcism, the palmately-cleft calyx of the female flowers, and by its style and seeds.

Its sting is extremely irritant, rapidly producing large blisters.

Order LXX. URTICACEÆ.

A very large order of plants of varying habit spread through the warmer and temperate regions of the world. Five genera occur in Socotra. Two are found nearly all over the warmer regions of the globe, one is chiefly spread in America and tropical Africa, one has a distribution from south Europe through Africa and Asia, and the fifth is known, out of Socotra, only from Australia and the Cape of Good Hope.

1. DORSTENIA.

Dorstenia, Linn. Gen. n. 158; Benth. et Hook. Gen. Pl. iii. 366.

A genus of about fifty species chiefly found in America and tropical Africa. Two species only are Asiatic, one occurring in Arabia, and the other in India.

D. gigas, Schweinf. in Proc. Roy. Soc. Edin. xii. (1883), 95. Tab. XCV.

Caulescens caudice crassissimo carnoso ramoso; foliis oblanceolatis bullatis; receptaculo orbiculari margine 6–8-radiato.

Planta crassa 2–5-pedalis flavo-lactescens caudice tuberoso globoso cortice albo breviter et candelabriformiter ramosa, ramis crassis tessalatim cicatricosis glabris. *Folia* ad apices ramulorum tantum manentia in planta adulta 6 poll. longa 1 poll. lata in juvenilibus $1\frac{1}{4}$ poll. longa $\frac{1}{6}$ poll. lata oblanceolata sæpe lateraliter curvata versus apicem contracta obtusa v. acuta deorsum in petiolum brevissimum gradatim attenuata margine obscure crenulata revoluta membranacea plusminusve bullata delicatim venulosa venulis rubris subtus subtiliter pubescentia; petiolus crassus supra concavus obscure puberulus. *Stipulæ* minutæ subulatæ v. squamiformis. *Hypanthodia* in axillis supremis solitaria, pedunculis $\frac{1}{2}$–$\frac{2}{3}$ poll. longis erectis validis breviter pubescenti-velutinis, parte superiore florigera orbiculari $\frac{2}{3}$ poll. diam. margine velutina radiata radiis brevibus obtusis 6–8 inæqualibus plerumque alterne majoribus. *Flores* masculi fœmineique intermixti. *Fl.* ♂—*Stamina* 2 filamentis membranaceis acuminatis exsertis. *Fl.* ♀—*Ovarium* globosum breviter stipitatum album; stylus subulatus, stigmate acuto. *Fructus* ignotus.

Socotra. In crevices and rocky places on the hills. B.C.S. n. 638. Schweinf. n. 737.

Distrib. Endemic.

A very curious species. In some respects it is not unlike *D. radiata*, Lamk. (Encyc. ii. 318; Boiss. in DC. Prod. xvii. 275), described and figured by Forskål (Fl. Ægypt. Arab. 164. t. 20), under the name *Kosaria species*. This is its nearest ally, but the Socotran species is a more grotesque plant having a much thicker and more gouty stem, and in its technical characters, notably foliage and hypanthodia, is widely separate.

Our plant in general character is not unlike an *Adenium*, having the same stout stems and the leaves clustered at the end of thick branches. The plant bleeds very freely on being wounded, yielding a yellow viscid juice which soon hardens into a yellowish-brown cake. The leaves on small plants of this species differ somewhat from those on larger and more adult plants. They are much narrower, with margins greatly revolute and so bullate as to make the upper surface quite rough. We only obtained plants with young flower buds. Schweinfurth got splendid flowering specimens, and as he was enabled thereby to identify its genus we have retained his specific name. There are several plants of this now growing in this country, and Schweinfurth has it in cultivation at Cairo. For further remarks as to its structure see Appendix.

2. FICUS.

Ficus, Linn. Gen. n. 1168; Benth. et. Hook. Gen. Pl. iii. 367.

A vast genus spread all over the warmer regions of the globe. Many of the species are polymorphous, and they are very difficult to define and to determine. Of three species in Socotra, one is endemic, one is a tropical and south African form found also in Arabia, and the third is probably an endemic one, but our specimens are not sufficient for determination.

1. F. (Urostigma) **socotrana**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 96.

Arborea ramulis pubescentibus; foliis rotundato-cordatis molliter pubescentibus 5-nervatis utrinque alterne 5–8-costatis; stipulis villosis; hypanthodiis obovatis pubescentibus; acheniis ovoideis levibus perianthio membranaceo inclusis.

Arbor magna umbragea ramulis validis annulatis pubescente-tomentosis. *Folia* magna petiolata maxima pedalia 8 poll. lata plerumque 6 poll. longa 4 poll. lata v. minora rotundato-cordato acumine apicali obtuso lobis basalibus subæqualibus sinu alto margine obscure subsinuata parum revoluta coriacea molliter pubescentia basi 5-nervia utrinque alterne 5–8-costata nervo medio costisque subtus prominentibus; petiolus striatus 2–3½ poll. longus fulvo-tomentoso-pubescens glandula sublaminari nigra nitida. *Stipulæ* dense villosæ coriaceæ late ovatæ. *Hypanthodia* axillaria bina $\frac{7}{12}$ poll. longa $\frac{1}{3}$ poll. lata obovata extus pubescente-tomentosa; calyculi lobi minuti rotundati; pedicelluli $\frac{1}{6}$–$\frac{1}{4}$ poll. longi validi dense pubescentes; bracteæ basilares late ovatæ rufæ. *Fl.* ♀ sessiles v. pedicellati bracteolis interfloralibus acuminatis carinatis. *Perianthii* segmenta membranacea. *Stigma* complanatum expansum. *Achenia* ovoidea nitida levia perianthio inclusa, pericarpio intus crustaceo extus carnosulo.

NOM. VERN. Tuk (Wellst.). Teke (Schweinf.).

Socotra. Abundant. B.C.S. n. 283. Schweinf. n. 414.

DISTRIB. Endemic.

A large tree, one of the largest on the island, affording a very grateful shade. It is a distinct species, though not far removed from *Ficus platyphylla*, Cailliaud (Cent. d. Pl. d'Afr. 62), (*Urostigma platyphyllum*, Kotschy Aufz. Phaner. u. Gefässkrypt. d. Nil. Länder 291, nom. sol.), a tree of Nubia. But that species has amongst other diagnostic characters longly peduncled hypanthodia. In the same alliance may also be mentioned *Urostigma catalpæfolium*, Miq. (in Hook. Lond. Journ. vi. 551), a tropical African tree, and the Indian *Urostigma Dalhousiæ*, Miq. (*loc. cit.* 571). But there is no likelihood of their being confounded with our plant.

2. F. (Urostigma) salicifolia, Vahl Symb. i. 82. t. 23 (non Miq.).

F. indica, Forsk. Fl. Ægypt. Arab. 179.

Urostigma salicifolium, Miq. in Hook. Lond. Journ. vi. 556.

NOM. VERN. Etheb.

Socotra. Spread over the island. B.C.S. nn. 354, 410, 448, 476, 646, 647. Schweinf. nn. 339, 473.

DISTRIB. Considerable range in tropical Africa and in Arabia; also found in south Africa.

This species varies to a considerable extent, and the specimens we obtained at different parts of the island show a fair amount of variation.

n. 410 may be taken as the typical tropical African form, with downy shoots and small oblong lanceolate leaves somewhat cordate at the base, and with small fruits about the size of a pea, which are pubescent and have a few red-capped glandular hairs on them. n. 354 is a form nearly typical, only having leaves slightly larger and less cordate at base. Schweinfurth's n. 339 is very nearly this; but the leaves are larger and are not so cordate at the base, the flowering shoots being glabrous, the nonflowering downy.

In Schweinfurth's n. 473 we have again a small-leaved form, but the leaves are somewhat elliptic with a distinct acumen—the twigs are usually pubescent. An exaggerated form of this we have in our n. 646, and here, too, the fruits are considerably larger and more densely tomentose.

In nn. 476 and 647 we have the extremes of variation as exhibited in Socotra. The twigs are here long, sparsely leaved, and glabrous, and the leaves themselves are much elongated, often attaining a foot in length, but remaining narrow and having an apical acumen. The stipules, too, are somewhat smaller. The larger bracteoles at the mouth of the hypanthodium are in these specimens nearly orbicular, and show no keeling, whilst in all the other forms these have a keel, and are more oblong. I do not, however, find

any good characters enabling me to define these as of a different species from the others, and therefore, for the present at least, include them as a form of this widely-spread species.

3. Ficus sp.

We have specimens of another fig showing foliage-leaves only, which I have not been able to identify, and it is probably a new one. It belongs to the set which includes *F. Sycomorus*, Linn. (Sp. 1513; Boiss. Flor. Orient. iv. 1155; and *F. pseudosycomorus*, Dcne. Flor. Sinaic. 4; Boiss. *loc. cit.*).

Socotra. B.C.S. n. 451.

3. POUZOLZIA.

Pouzolzia, Gaud. in Freyc. Voy. Bot. 503; Benth. et Hook. Gen. Pl. iii. 387.

A considerable genus distributed in the tropics of both worlds, though chiefly in the old world.

P. auriculata, Wight Ic. t. 1980, f. 2, t. 2099, f. 37 and tab. cit. in Wedd. Monog. Urtic. 393, and in DC. Prod. xvi. 1, 225.

Socotra. Not uncommon on the hills. B.C.S. n. 624. Schweinf. n. 675.

Distrib. Indian Peninsula and Ceylon.

This extremely variable species, for the extensive synomymy of which and references to Wight's figures, Weddell's work must be consulted, occurs frequently on the island, and presents foliage varying in form from widely elliptical to narrowly lanceolate.

4. FORSKOHLEA.

Forskohlea, Linn. Mant. n. 1262; Benth. et Hook. Gen. Pl. iii. 393.

A small genus of herbs spread through Africa, Arabia, and India, also occurring in south Europe.

F. viridis, Desf. Cat. Hort. Par. ed. 3, 347; Wedd. Monog. Urtic. 537, t. xix. B. ff. 5, 13, and in DC. Prod. xvi. 1, 235[56]; Franch. Sert. Somal. in Miss. Révoil 65.

Socotra. Common. B.C.S. n. 58. Schweinf. nn. 309, 494.

Distrib. Atlantic Islands, Abyssinia, and Arabia.

5. AUSTRALINA.

Australina, Gaud. in Freyc. Voy. Bot. 505; Benth. et Hook. Gen. Pl. iii. 394.

A small genus of herbs limited hitherto to Australia and south Africa. The Socotran plant is a south African form.

A. capensis, Wedd. in Ann. Sc. Nat. sér. 4, i. (1854), 212.

Didymodoxa debilis, E. Mey. in Sched. Pl. Drèg.; Wedd. Monog. Urtic. 548, t. 20, f. B, and in DC. Prod. xvi. 1, 235[59].

Socotra. On the hill slopes with species of *Galium* and *Valerianella*. B.C.S. n. 487.

Distrib. South Africa.

Another interesting relationship with the south African flora is established by the discovery of this plant in Socotra.

MONOCOTYLEDONES.

Order LXXI. HYDROCHARIDEÆ.

A small family of water plants. The fresh-water species are found widely spread over warmer and temperate regions of both the old and new world; the marine forms are chiefly and almost entirely developed in the Indian Ocean and adjacent seas—but some species are described from districts in the new world.

LAGAROSIPHON.

Lagarosiphon, Harv. in Hook. Journ. Bot. iv. 230, t. 22; Benth. et Hook. Gen. Pl. iii. 450.

A small genus of about five species of submerged fresh-water plants. Tropical Africa, south Africa, Madagascar, and India are the areas of their limited distribution.

L. Roxburghii, Benth. in Benth. et Hook. Gen. Pl. iii. 451.

Vallisneria alternifolia, Roxb. Flor. Ind. iii. 750; Wight in Hook. Bot. Misc. ii. 344, Suppl. t. 11.

Nechamandra Roxburghii, Planch. in Ann. Sc. Nat. sér. 3, xi. (1849), 78.

Socotra. In pools formed by the rivers. Boivin n. 1064.

Distrib. India, Malay Peninsula, and some of the islands of the Eastern Archipelago.

This is a plant collected by Boivin but absent alike from Schweinfurth's and from our collections. To Dr Schweinfurth I am indebted for the information that a specimen from Socotra is in Berlin Herbarium. This I learn from Professor Eichler is a duplicate from Paris Herbarium, and he has kindly sent me a small fragment of it. Professor Ascherson identifies it as above, and after examination of the small portion sent to me, I agree with him. He suggests it is introduced in Socotra.

Order LXXII. ORCHIDEÆ.

A very vast order largely represented in tropical regions, rarer in dry districts.

HABENARIA.

Habenaria, Willd. Sp. Pl. iv. 44; Benth. et Hook. Gen. Pl. iii. 624.

A vast and polymorphous genus widely dispersed over the temperate and warmer regions of the globe.

H. socotrana, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 96. Tab. LXXXII, B.

Glabra caule gracili; foliis membranaceis oblanceolatis v. oblongis; racemis elongatis floribus distantibus; bracteis ovario brevioribus attenuato-acuminatis; sepalis petalisque obtusis, labello 3-partito lobis linearibus calcare gracillimo ovario longiore.

Sesquipedalis glabra caule gracili erecto basi tuberosa. Folia plus minus basi rosulata v. per partem infimam caulis approximatim disposita, lamina sæpe $5\frac{1}{2}$ poll. longa 1 poll. lata sed ad $1\frac{1}{2}$ poll. longam et $\frac{1}{2}$ poll. latam varians oblanceolata v. longe oblongo-elliptica apice acuta sæpe cuspidata basi gradatim attenuata margine integra v. obscure crenulata; vagina $3\frac{1}{4}$ poll. longa integra laxa. Folia bractealia caulinia pauca remota lanceolata acuminata amplexicaulia sed vix vaginantia. *Racemi* sublaxi elongati sæpe $\frac{3}{4}$ ped. longi, pedicelli $\frac{1}{5}$ poll. longi; bracteæ oblongo-ellipticæ acuminatæ ad medium ovarii attingentes. *Sepala* intus glandulosa, posticum ellipticum obtusum subapiculatum concavum erectum 3-nervium $\frac{1}{8}$ poll. longum $\frac{1}{12}$ poll. latum; lateralia ovata obtusa 1-nervia. *Petala* lateralia oblonga falcata apice venulis conjunctis 1-nervia intus glandulosa. *Labellum* alte trifidum medio segmento $\frac{1}{6}$ poll. longiore lobis linearibus obtusis, calcare longissimo $\frac{1}{3}$ poll. longo arcuato binervoso lineari acuto. *Stigmatici* appendices breves rotundatæ. *Capsula* $\frac{1}{3}$–$\frac{1}{2}$ poll. longa.

Socotra. On the hills near Galonsir. B.C.S. n. 315. Nimmo.

Distrib. Endemic.

A species having a close alliance with *H. attenuata,* Hook. f. (in Journ. Linn. Soc. vii. (1864) 221), a plant of the Cameroon mountains at an elevation of over 7000 feet, but it is readily distinguished from it by the more delicate habit with rosulate basal leaves, and the bracts of the racemes shorter than the ovaries. Welwitsch's Angola plant described as *H. Spiranthes* by Reichenbach f. in Flora 1865, 178, is also not far removed.

A small and new species which we only gathered in one spot on the island. It is amongst the plants in Kew Herbarium from Nimmo.

Order LXXIII. IRIDEÆ.

An order widely dispersed over the old and new worlds, especially in temperate regions, and having a great development in the Mediterranean region, and south Africa. The two genera in Socotra are of much interest. One,

Babiana, is otherwise entirely south African, whilst the other is a Mediterranean genus extending over the Cameroon mountains, and Atlantic Islands to south Africa.

1. ROMULEA.

Romulea, Maratti, Diss. Romul. et Saturn., Romæ, 1772, 13, t. 1; Benth. et Hook. Gen. Pl. iii. 694.

A considerable genus of western Europe, the Mediterranean region, and extending through west tropical Africa (occurring on the Cameroon Mountains), and the Atlantic Islands to south Africa. The Socotran plant is the most easterly extension and the only one in this direction.

R. purpurascens, Tenore, Mem. 117; Jourd. and Four. Ic. t. 106, f. 161,

var. **edulis**, Baker in Journ. Linn. Soc. xvi. (1878), 87.

Bulbo parvo globoso eduli; foliis 4 angustissime linearibus semipedalibus vel pedalibus margine revolutis; pedunculis 2–4-pollicaribus solitariis vel geminis; spathæ valvis oblongo-lanceolatis exteriore firmiore majore semipollicari; perianthii tubo erecto limbo triplobreviore segmentis oblongis semipollicaribus saturate purpureis omnibus laxe trinervatis; genitalibus limbo duplobrevioribus.

Trichonema edule, Herbert in herb. Kew.

Socotra. At over 3000 feet altitude on the Haghier hills. Schweinf. n. 580. Nimmo. Wellsted.

Distrib. Of the species—Mediterranean region. Of the variety—endemic.

Schweinfurth sends two fruiting pedicels of this plant, and in Kew Herbarium are specimens from Nimmo, to which Herbert has added this note, "Found by Wellsted in Socotra, where the bulb is eaten." Baker (*loc. cit.*) cites the plant from the shores of the Red Sea as well as Socotra, quoting the ticket attached to Nimmo's specimens, but, as I have so often explained, his plants so labelled are really Socotran.

We do not appear to have collected this species, and Schweinfurth's very poor specimens are brought from a very high altitude.

Mr Baker has kindly supplied me with the above description of this variety.

2. BABIANA.

Babiana, Ker in Kœn. et Sims, Ann. Bot. i. 233; Benth. et Hook. Gen. Pl. iii. 706.

A small genus of species confined to south Africa, extending from the Cape itself as far north as the Transvaal, with the exception of the one we discovered in Socotra.

Sir Joseph Hooker, alluding to the Socotran plant in the Botanical Magazine (t. 6585), remarks regarding the genus—"In respect of the distribution of Cape types of vegetation, the occurrence of a *Babiana* to the north of the Equator, and especially so far east as the Arabian Sea, is a very interesting fact; for it

is another instance of that botanical affinity of Socotra with the Cape which I have alluded to under *Begonia socotrana* (t. 6555). Singularly enough no species of the genus occurs in Angola, or any of the collections from the Lake regions of Central Africa, where, however, it may be expected to occur when these are better botanically explored."

B. socotrana, Hook. f. in Bot. Mag. t. 6585.

Parvula acaulis glaberrima bulbi tunica reticulatim fibrosa; foliis auguste lanceolatis sensim acuminatis rigidulis plicatis et striato-nervosis; floribus solitariis parvis inter folia sessilibus; spathæ valvis linearibus; perianthii tubo elongato gracillimo limbo bilabiato ringente pallide violaceo segmentis elliptico-lanceolatis acutis.

3–4 poll. alta. *Bulbi* ½–¾ poll. diam. subglobosi sursum abrupte in collum ½ poll. longum contracti vagina fibrorum fuscorum firme reticulatorum tecti. *Folia* bifaria 3–4 poll. longa ¾ poll. lata ab medio ultra acuminata nervis plurimis validis; petiolus obliquus latus compressus. *Perianthii* tubus 1¼ poll. longus, limbus fere 1 poll. latus segmentis subæqualibus. *Stigmata* vix protrusa cærulea.

Socotra. On the hill slopes south-west from Galonsir. B.C.S. n. 249.

Distrib. Endemic.

Sir Joseph Hooker remarks regarding this plant—"I can find no generic difference at all between *B. socotrana*, and the south African Babianas; it is, however, much the smallest known species of the genus, and is one of the few that is perfectly glabrous. Its nearest affinity is with *B. plicata* (G. in Bot. Mag. t. 576)." We only obtained poor specimens of the plant in leaf and withered flower in February 1880, but the bulbs we brought home flowered in September of the same year at Kew, and from these specimens the plant has been figured.

Order LXXIV. AMARYLLIDEÆ.

A large order dispersed over the warmer and temperate regions of the world and greatly developed in dry sandy and stony regions. Of the two Socotran genera, one has the distribution of the order, the other is a genus of south Africa of which a few species also occur in tropical Africa.

1. CRINUM.

Crinum, Linn. Gen. n. 405; Benth. et Hook. Gen. Pl. iii. 726.

A considerable genus of showy-flowered species distributed in tropical and subtropical regions of the whole globe.

C. (Platyaster) Balfourii, Baker in Bot. Mag. Tab. 6570, and in Gard. Chron. xvi. 1881, 72.

Bulbo ovoideo brevicollo; foliis 10–12 synanthiis loratis firmulis viridibus vix pedalibus apice deltoideis; scapo compresso foliis subduplo-longiori; umbellis 10–12-floris; spathæ valvis

lanceolato-deltoideis; pedicellis crassis brevissimis; perianthii tubo recto viridulo bipollicari limbi segmentis lanceolatis albis tubo æquilongis; filamentis segmentis distincte brevioribus, antheris parvis lineari-oblongis.

Bulbus 3 poll. diam. *Folia* patentia arcte venulosa 1½–2 poll. lata margine anguste cartilaginea denticulata. *Scapus* sub foliis oriens ab apice bulbi 1½–2-pedalis. *Flores* fragrantissimi 10–12 in quaque umbella. *Spathæ* valvi pallidi. *Bracteolæ* longæ filiformes albæ. *Perianthii* tubus cylindricus bipollicaris segmentis ½ poll. latis horizontaliter patentibus. *Filamenta* erecto-patentia segmentis perianthii triente breviora. *Ovarium* oblongum ½ poll. longum; stylus staminibus æquilongus rubescens.

Socotra. On the high plains at an elevation over 1500 feet, south-west from Galonsir. B.C.S. n. 129. Schweinf. in lit.

Distrib. Endemic.

Mr Baker remarks regarding this plant—"A well marked new species of Crinum. Its nearest alliance is with two Himalayan species *C. amœnum*, Roxb., and *C. longifolium*, Roxb. (Hort. Beng. 23).

We obtained the plant with foliage leaves only, but the bulbs brought home flowered at Kew in the late autumn of 1880, and from them the figure and description in the Botanical Magazine were taken. The flowers are extremely fragrant, and though the perianth segments are rather narrow the truss of flowers is handsome, and the plant is an acquisition horticulturally.

2. HÆMANTHUS.

Hæmanthus, Linn. Gen. n. 400; Benth. et Hook. Gen. Pl. iii. 730.

A genus essentially south African but with a few tropical African representatives.

H. grandifolius, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 96.

Glaber et nonaculeatus. Folia 2 magna sæpe 1¼ pedalia ¾ ped. lata ovata v. elliptico-ovata acuta basi parum attenuata v. plerumque rotundata v. rotundato-cordata margine vix undulata tenuia delicatim venulosa; petiolus 1–1½ poll. longus non vaginans.

Socotra. On the stream banks of the slopes of Haghier south from Tamarida. B.C.S. n. 194.

Our specimens of this species are confined to the leaves. We obtained bulbs but they have not grown in this country. The leaves are, however, so very distinct, being very much larger than in any known species with short petioles, that on our scant material we have ventured the diagnoses of a new species.

Order LXXV. DIOSCOREACEÆ.

An order of few genera dispersed over the tropical and temperate regions of the world.

DIOSCOREA.

Dioscorea, Linn. Gen. n. 1122; Benth. et Hook. Gen. Pl. iii. 742.

A large genus with the distribution of the order.

D. lanata, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 96.

Volubilis caule tereti piloso; foliis cordatis v. rotundatis v. reniformibus apice spinoso-mucronatis 7–9-nervatis subtus lanatis; spicis solitariis axillaribus; fl. ♂ glomeratis, staminibus 6, ovarii rudimento depresso triquetro; fl. ♀ solitariis, capsulis pubescentibus.

Volubilis ramis levibus teretiusculis sparsim pilosis. *Folia* petiolata magnitudine variantia maxima 4–5 v. 8 poll. longa 3–3½ poll. lata minima 1¾ poll. longa 1¼ poll. lata cordata v. cordato-rotundata v. subreniformia apice obtusa v. acuta mucrone duro deltoideo spinoso instructa basi lobis lateralibus late rotundatis sinu intermedio alto margine parum incrassata revoluta tenuia submembranacea 7–9-nervia supra pilosa subtus albido-lanata; petiolus angulatus piloso-pubescens cum foliorum magnitudine varians ¼–4 poll. longus. *Spicæ masculæ* axillares solitariæ simplices v. pauci-ramosæ 6–8 poll. longæ; rhachis tenuis piloso-pubescens angulata; bracteæ minutæ ovato-acutæ floribus dimidio breviores. *Flores* sessiles 2–3-aggregati. *Perianthium* $\frac{1}{10}$ poll. longum extus basi pilosum 6-partitum segmentis membranaceis obovatis v. ovato-rotundis obtusis. *Stamina* 6 supra basin perianthii inserta eoque breviora filamentis subulatis antheris æquilongis; antheræ dorso medio adnatæ introrsæ. *Pistilli* rudimentum triquetrum apice depressum. *Spicæ fœmineæ* breviores axillares 2–3 poll. longæ; rhachis tenuis piloso-pubescens; bracteæ ut in masculis. *Flores* sessiles solitarii. *Ovarium* villoso-pubescens. *Capsulæ* cernuæ breviter stipitatæ tripteræ ⅔ poll. diam. pubescentes. *Semina* minute rugulosa transverse elliptica ⅚ poll. diam. ala fusca.

Nom. Vern. Seifcha (B.C.S.).

Socotra. On many parts of Haghier. B.C.S. n. 482. Schweinf. in lit. Nimmo

Distrib. Endemic.

This is apparently a new species, possibly a near ally of *D. spinosa*, Roxb.; (Wall. Cat. n. 5103), a form I have not seen, and it has some resemblances with forms of *D. sativa*, Linn. (Sp. 1463; Kunth Enum. v. 340). Its most prominent features are its leaves, woolly underneath and with a spiny apical mucro, and the solitary axillary male inflorescences.

In Kew Herbarium there are plants of this species sent by Nimmo from the island. The tuber is sought after by the troglodytic inhabitants. Specimens of the tuber we brought home produced male flowers at Kew in August 1880, and in Edinburgh the following year. From the Kew flowers our description is taken. We only found the plant in fruit on Socotra.

Order LXXVI. LILIACEÆ.*

A very large order of tropical and temperate regions, most abundant in the latter, and especially developed in dry sandy districts. Seven genera are

* To Mr J. G. Baker I am indebted for the description of, and notes to, the new species in this order to which his name is attached.

known from Socotra. One of these, *Dracæna*, is dispersed over the whole globe, but the section to which the Socotran species belongs is limited to a few spots in north Africa and the Atlantic islands; the genus *Asparagus*, has a general old world distribution; three—Asphodelus, *Dipcadi*, and *Urginea*—reach from the Atlantic islands through Africa and the Mediterranean region (two of them extending to south Africa) to northern India; one—*Anthericum*—is world-wide except in Asia, and *Aloe* is an African, especially south African, genus, reaching to the Atlantic and Indian Ocean Islands.

1. ASPARAGUS.

Asparagus, Linn. Gen. n. 424; Benth. et Hook. Gen. Pl. iii. 725.

A large genus widely dispersed in the warmer and temperate regions of the old world.

A. africanus, Lamk. Encyc. i. 295; Baker in Journ. Linn. Soc. xiv. (1875), 619.

Asparagopsis Lamarckii, Kunth Enum. v. 87.
A. juniperina, Kunth Enum. v. 85.

var. **microcarpus**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 411.

Suffruticosus intricato-ramosus cortice griseo nitido levi ramulis anfractuosis; foliis spinosis brevibus $\frac{1}{12}$ poll. longis recurvis; floribus in umbellis interdum paucis; baccis parvis $\frac{1}{8}$ poll. diam. pedicello brevi.

Socotra. Abundant on the plains. B.C.S. n. 16. Schweinf. n. 374.

DISTRIB. Of the species—Tropical and south Africa. Of the variety—endemic.

Our Socotran plant presents several features of difference from the type of the species, but the technical differences between them are so slight, more especially in the case of Cape forms described as *Asparagopsis juniperina* by Kunth, that I can get no good characters for a specific diagnosis and I have only made it a variety. Its most prominent features are its densely and intricately branched habit with numerous spines and short anfractuose twigs producing a spine at each node. The cladodes are, perhaps, as a rule shorter and thinner than is typical. The flowers are usually slightly smaller and shorter with few developing in the umbels, sometimes reduced to one but commonly two or three, this last being a character in which it approaches the Indian *A. subulatus*, Steud. (in Hohen. Pl. Ind. Exsicc. No. 1303), and the south African *A. consanguineus*, Baker (*l.c.* 615). Finally, the fruit is to be noted as it is much smaller, only one-third the size, than in the type, and the pedicels are also much shorter. This is one of the commonest plants on the plains about Galonsir and elsewhere.

2. ALOE.

Aloe, Linn. Gen. n. 430; Benth. et Hook. Gen. Pl. iii. 776.

A considerable genus with headquarters in south Africa and representatives

through tropical Africa and the islands of the Atlantic and Indian Oceans. Both the Socotran species are endemic.

1. **A. Perryi**, Baker in Journ. Linn. Soc. xviii. (1881), 161, and in Bot. Mag. t. 6596.

Caulescens; foliis 12–20 dense rosulatis lanceolatis acuminatis subpedalibus a basi ad apicem sensim angustatis glauco-viridibus rubrotinctis facie canaliculatis dentibus marginalibus deltoideo-cuspidatis parvis pallide brunneis; pedunculo deorsum applanato; racemis 1–3 oblongo-cylindricis; pedicellis flore 3–4-plo brevioribus; bracteis minutis lanceolato-deltoideis; perianthii rubro-lutei pollicaris segmentis oblongis tubo cylindrico triplo-brevioribus; genitalibus demum breviter exsertis.

Caulis simplex circa pedalis 1–2 poll. diam. *Folia* $\frac{2}{3}$–1 ped. longa ad basin $2\frac{1}{2}$–3 poll. lata apice acuminata immaculata obscure verticaliter lineata supra basin canaliculata medio $\frac{1}{6}$–$\frac{1}{3}$ poll. crassa dentibus marginalibus crebris $\frac{1}{12}$ poll. longis remotis intervallis 1 poll. longis apice corneis, infimis exceptis abscendentibus. *Inflorescentia* $1\frac{1}{2}$–2 ped. longa rarius simplex plerumque ramis tribus densifloris 3–6 poll. longis 2 poll. diam.; pedunculus communis vix pedalis purpureo-tinctus; pedicelli rubri $\frac{1}{4}$–$\frac{1}{3}$ poll. longi infimi cernui; bracteæ pedicellis subæquilongæ. *Perianthium* $\frac{3}{4}$–1 poll. longum rubrum in juventute apicaliter virido-tinctum proventu flavum tubo ad medium subconstricto. *Capsula* oblonga $\frac{3}{4}$ poll. longa subglauca.

Nom. Vern. Tâyef (Wellst., B.C.S.).

Socotra. In various parts of the island. B.C.S. n. 473. Schweinf. n. 744. Perry. Collins.

Distrib. Endemic.

A plant of very great interest, being the source of one of the kinds of aloes. Mr Baker thus writes of it:—"It is said that aloes was known to the Greeks as a product of the island of Socotra as early as the fourth century before the Christian era; and yet until very recently no material has been obtained from which the botanical characters of the plant which yields the drug could be settled. In the absence of any precise information on the subject, botanists and pharmacists have supposed that the plant that furnished it was an Aloe figured in 1697 by Commelinus from the Medical Garden at Amsterdam under the name of '*Aloe Succotrina Angustifolia Spinosa flore purpureo*,'—a species which was called *Aloe vera* by Philip Miller, and has been characterised by Lamarck and several later authors under the name of *Aloe succotrina*. By the researches of Mr Bolus this plant has now been ascertained to be really a native of the Cape of Good Hope, and the Socotra Aloe proves to be a species confined to that island, closely allied in general habit to the well-known Barbadoes Aloe (*Aloe vera*, Linn., *A. barbadensis*, Miller, *A. vulgaris*, Lamk.), but differing in its shorter leaves and especially in its flowers, which have a tube much longer than the segments and are arranged in looser racemes on longer pedicels."

The plant was first brought to this country by Wykeham Perry in 1878,

and in the following year by Collins, but their specimens were not sufficient to afford a complete knowledge of the plant. We were fortunate in bringing home many plants alive which have thriven and some have flowered in this country, so that we now know the species thoroughly well.

On Socotra the plant grows plentifully, sometimes it is to be found almost at the sea-level, but it is most abundant on the hills at some elevation. From it the inhabitants obtain the juice which, inspissated, forms the Socotrine aloes of commerce, designated by them with the same name as the plant, "Tâyef." The collection of the drug is, however, very haphazard. For an account of this, and also for further remarks regarding the drug, see the Introductory Chapter and the Appendix to this volume, where also reference is made to the account of the drug given by Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 107).

2. A. squarrosa, Baker in Proc. Roy. Soc. Edin. xii. (1882), 97.

Caulescens caudice simplici; foliis parvis laxe dispositis lanceolatis patulis maculatis apice recurvatis aculeis marginalibus magnis crebris deltoideis; scapo brevi simplici ancipiti; racemo simplici cernuo; pedicellis brevibus ascendentibus bracteis lanceolatis; perianthii cylindrici tubo brevi; staminibus inclusis; stylo exserto; capsula parva.

Caulis 6–9-pollicaris simplex teres $\frac{1}{4}$–$\frac{1}{3}$ poll. diam. dimidio inferiori nudus basibusque membranaceis foliorum delapsorum cinctus. *Folia* producta 6–15 laxe disposita patula conspicue squarrosa $1\frac{1}{2}$–2 poll. longa $\frac{1}{2}$–$\frac{2}{3}$ poll. lata e basi ad apicem acuminatum sensim attenuata aculeis marginalibus patulis crebris corneis $\frac{1}{12}$ poll. longis. *Scapus* simplex 2–3-pollicaris bracteis paucis vacuis præditus; racemus $1\frac{1}{2}$–2-pollicaris subdensus; pedicelli adscendentes $\frac{1}{4}$–$\frac{1}{3}$ poll. longi apice orbiculati; bracteæ lanceolatæ acuminatæ albæ $\frac{1}{6}$–$\frac{1}{4}$ poll. longæ striis 3 brunneis percursæ. *Perianthium* pallide rubrum $\frac{3}{4}$–$\frac{5}{6}$ poll. longum. *Stamina* perianthio paullo breviora antheris parvis luteis. *Stylus* $\frac{3}{4}$ poll. longus. *Capsula* oblonga $\frac{1}{3}$ poll. longa.

Socotra. On the limestone cliffs south-west from Galonsir at an elevation of 1000 feet. B.C.S. n. 282.

Distrib. Endemic.

A very distinct spotted-leaved species. Its nearest ally is the Cape species *A. consobrina*, Salm Dyck (Monog. Al. sect. xviii. f. 3), a plant long in cultivation in this country, but that species has much larger leaves and erect inflorescences as well as other features of difference.

We only found two plants of this species at one locality in Socotra, at the base of the limestone cliffs south-west of Galonsir. Probably it is a scarce plant. Schweinfurth does not send it.

3. DRACÆNA.

Dracæna, Vandel. ex Linn. Mant. n. 1256; Benth. et Hook. Gen. Pl. iii. 779.

A considerable genus widely dispersed in the warmer regions of the old world.

D. Cinnabari, Balf. fil. in Trans. Roy. Soc. Edin. xxx. (1882), 623.

Arborea robusta ramosa; foliis ensiformibus patento-erectis rigidis supra concavis; paniculis glabris ramulis penultimis elongatis compressis, pedicellis validis brevibus, bracteolis longis acuminatis; perianthio sordido segmentis apice uncinatis; filamentis antheris duplo-longioribus; stigmate trilobato.

Arbor 25-pedalis trunco crassitie 3-ped. attingente cicatricibus foliorum delapsorum notato apice copiose ramosa umbraculiformis. *Folia* 1–2-pedalia 1–1¼ poll. lata ¼–½ poll. crassa sessilia ad apices ramorum validorum conferta patento-erecta firma sed in plantis juvenilibus frequenter longiora et sæpe subrecurva basi amplexicaulia et piscis caudæ homocercæ similitudine expansa ibique 4 poll. lata rubescentia sursum gradatim attenuata ensiformia supra concava infra jugo medio prominente lateribus convexis apice trigona obtusa punctata ecostata glabra glauco-viridia margine concoloria. *Paniculi* glabri pseudo-terminales inter folia evoluti 1–2½-pedales multo-ramosi ramis et ramulis divaricatis antepenultimis compressis subtortis striatis 9–12 poll. longis penultimis contractis 2–4-floris; pedicelli validi ⅕ poll. longi supra medium articulati; bracteolæ membranaceæ longæ acuminatæ. *Perianthium* sordidum ¼ poll. longum segmentis oblongis vix connatis apice uncinatis. *Stamina* inclusa filamentis subulatis; antheræ oblongæ filamentis dimidio breviores. *Ovarium* oblongum stipite valido; stylus ovario æquilongus stigmate trilobato. *Baccæ* aurantiacæ ½ poll. diam.

Nom. Vern. Of the tree—Kharya (B.C.S.). Of the resin—Edah (Wellst., B.C.S.).

Socotra. Common on the hills. B.C.S. n. 11. Schweinf. nn. 565, 785. Perry.

Distrib. Endemic.

One of the most interesting plants of the island. Like *D. Draco*, (Linn. Syst. Nat. (1767), ii. 246); Baker in Journ. Linn. Soc. xiv. (1875), 527), from the Canary Islands, *D. Ombet*, Kotsch. and Peyr. (Plant. Tinneanæ, 47), from Nubia, and *D. schizantha*, Baker (in Trim. Journ. Bot. vi. (1877), 71), from Somali Land, this is a resin-producing tree. The four species are by this character marked out from others of the genus, and they also agree with one another in general habit, which is that of a more or less forkedly-branching thick-stemmed tree, with leaves forming dense tufts at the ends of the stout ultimate branches, which are arranged so as to form a larger or smaller umbrella-crown.

These four species which thus form a distinct group in the genus, and one of a very ancient type, are quite distinct one from the other. Taking *D. Cinnabari* as described above, *D. Draco* differs in its compressed ensiform leaves, smaller bracteoles, greenish perianth the segments of which are not uncinate at the apex, anthers relatively to the filaments shorter, and the capitate stigma. *D. Ombet* has a less robust habit, more slender and shorter antepenultimate branches in the panicle, longer pedicels, non-acuminate bracteoles, and more delicate perianth. This latter is the species most nearly allied to our

Socotran plant, but it is not conspecific. *D. schizantha*, may be readily distinguished by its downy panicles.

It is a feature of considerable interest, from the point of view of geographical distribution, to find four species of a type such as this restricted to the centres in which they now flourish. This point has been referred to in the Introductory Chapter, and need not be further dwelt on here.

Regarding the red resin produced by the Socotran tree known in commerce as Dragon's Blood resin, its kinds, and the mode of its collection, I published some account when I described the species (Trans. Roy. Soc. Edin. xxx. 619), and shall not here repeat what is there written, except to mention that the Socotran Dragon's Blood being undoubtedly that spoken of by Dioscorides and the author of the Periplus of the Erythrean Sea as "*κιννάβαρι*," I have taken that as the specific name of our plant. For the characters of the Socotran resin and of other resins in commerce known as Dragon's Blood, the valuable paper by Dr Dobbie and Mr J. G. Henderson (Trans. Roy. Soc. Edin. xxx. (1883), 624) may be consulted, and also their subsequent paper in the Pharmaceutical Journal for 10th November 1883.

In the Appendix will be found some account of the anatomy of our Dragon's Blood tree.

Wellsted (in Journ. Roy. Geog. Soc. v. (1835), 198) gives a long description of the tree (calling it *Pterocarpus Draco*), but there is nothing in it calling for special citation, except that he states that the Arabs call Dragon's Blood "Dum khoheil."

4. ASPHODELUS.

Asphodelus, Linn. Gen. n. 421; Benth. et Hook. Gen. Pl. iii. 782.

A small genus of five species chiefly spread in the Mediterranean region, but extending to the Atlantic and Indian Ocean islands, Arabia, and to northern India itself.

A. fistulosus, Linn. Sp. 444; Kunth Enum. iv. 557; Baker in Journ. Linn. Soc. xv. (1877), 271; Bot. Mag. t. 984.

var. **tenuifolius**, Baker *loc. cit.*

A. tenuifolius, Cav. in Anal. de Ciencias Nat. iii. (1801), 46, t. 27, f. 2.
A. parviflorus, Wight Ic. t. 2062.

Socotra. On the hill slopes near Galonsir. B.C.S. n. 319.

Distrib. From the Atlantic Islands to the Indian Peninsula.

5. ANTHERICUM.

Anthericum, Linn. Gen. n. 422 (pro parte); Benth. et Hook. Gen. Pl. iii. 788.

A considerable genus with a European, African, and American distribution, but excluded from Asia.

A. (Phalangium) **graptophyllum,** Baker in Gard. Chron. xvii. (1882), 460.

Fibris radicalibus multis cylindratis; foliis vetustis in fibras validas copiosas dissolutis foliis productis lanceolatis dorso et facie glabris venis primariis validis 8–9-fasciis transversalibus pallide et saturate viridibus decoratis margine conspicue ciliatis; pedunculo brevi simplicifoliis 4–6 minutis scariosis bracteiformibus prædito; racemo laxo pauciflore; pedicellis 1–2-nis; perianthii albi infundibularis segmentis lanceolatis; staminibus perianthio brevioribus; antheris parvis luteis.

Perennis collo radicis fibris erectis dense tecto. *Folia* 12–16 rosulata $\frac{1}{2}$ sed sæpe 1 ped. longa $\frac{1}{2}$–$\frac{2}{3}$ poll. lata in medio versus extremitates ambos attenuata basali vagina, pollicaris. *Scapus* $1\frac{1}{2}$-2-pedalis simplex v. parum ramosus tenuis nodis plurimis bractiferis, bracteis inferne vacuis. *Racemus* laxus floribus remotis solitariis v. binis, pedicellis $\frac{1}{6}$ poll. longis prope basim articulatis. *Perianthium* $\frac{1}{3}$ poll. longum segmentis trinervatis. *Staminum* filamenta alba glabra subcomplanata; antheræ globosæ. *Ovarium* globosum; stylus perianthii segmentis æquilongus.

Socotra. On the hills in several places. B.C.S. n. 328. Schweinf. n. 607.

Distrib. Endemic.

A small flowered and not very showy species allied to the St Bruno's Lily of Europe, *A. Liliago,* Linn. (Sp. 445; Baker in Journ. Linn. Soc. xv. (1877), 301). Its closest relationship is, however, with a Nubian plant, *A. nubicum,* Baker (*loc. cit.*), and to the Somali Land, *A. inconspicuum,* Baker (in Trim. Journ. Bot. vi. (1877), 71). From both of which its strongly-ribbed foliage, and much longer scapes separate it.

In February we collected the plant, with foliage leaves only, in quantity on the hills south-west of Galonsir, and were fortunate to bring to this country living rootstocks. These flowered in June 1881 at Kew, and from them Mr Baker drew up his description, which, however, was not published until the plant again came into leaf in the spring of 1882.

Schweinfurth at the end of April obtained the plant near Kischen at an elevation of nearly 2000 feet, in full flower, but without leaves.

6. DIPCADI.

Dipcadi, Medicus in Act. Palat. vi. 431, ex eod. in Ust. Ann. ii. 13; Benth. et Hook. Gen. Pl. iii. 809.

A small genus with species spread over a region extending from the Canary Islands through the Mediterranean region and tropical and south Africa to south-west Asia and India.

D. (Tricharis) **Balfouri,** Baker in Gard. Chron. xiv. (1880), 424.

Bulbo ovoideo tunicis albo-viridibus; foliis 3–4 synanthiis ensiformibus erectis subpedalibus facie profunde canaliculatis; scapo tereti stricto 2–3-pedali; racemo laxo 10–12-floro,

pedicellis flore 2–3-plo brevioribus; bracteis lanceolatis; perianthio flavo-viridulo vix pollicari tubo oblongo, segmentis exterioribus oblongis falcatis tubo duplo-longioribus, segmentis interioribus parvis ovatis patulis; antheris sessilibus; ovario oblongo sessili stylo æquilongo.

Bulbus 1¼–1½ poll. diam. *Folia* læte viridia firma glabra acuta ¾–1 poll. lata. *Scapus* viridis. *Racemus* 6–9 poll. longus pedicellis adscendentibus ¼–½ poll. longis, bracteis infimis pedicellis brevioribus supremis longioribus. *Perianthii* tubus ⅙ poll. diam. segmentis interioribus gamophyllis sub apicibus patulis. *Filamenta* fauci segmentorum interiorum tubi affixa; antheræ lineares luteæ ⅛ poll. longæ. *Stylus* tubo perianthii interni æquilongus.

Socotra. B.C.S.

Distrib. Endemic.

In the Autumn of 1880 a bulb amongst the collection brought to this country by us from Socotra flowered at Kew, and proved to be of a new species of this genus, which Mr Baker has described. I have no record of its collection, and can say therefore nothing regarding its distribution on the island. "The affinity of the species is with the well-known *D. serotinum,* Medic. (Act. Palat. vi. 431 ex eod in Usteri Ann. ii. 13; Bot. Mag. t. 859), of the Mediterranean region, but the stature and characters readily distinguish it.

7. URGINEA.

Urginea, Steinh. in Ann. Sc. Nat. sér. 2, i. 321, t. 14; Benth. et Hook. Gen. Pl. iii. 810.

A moderate genus spreading from the Atlantic Islands through the Mediterranean region, tropical and south Africa to north-west India.

U. porphyrostachys, Baker in Proc. Roy. Soc. Edin. xii. (1883), 411.

Bulbo ovoideo; foliis hysteranthiis ignotis; scapo tereti fragili; racemo laxo elongato; pedicellis solitariis elongatis strictis erecto-patentibus; bracteis minutis lanceolatis calcaratis; perianthii parvi segmentis lanceolatis uninervatis albidis dorso late purpureo-vittatis; staminibus inclusis filamentis glabris antheris parvis oblongis; fructu acute angulato; seminibus in loculo 2–3 magnis nigris discoideis.

Bulbus 1½–2 poll. longus tunicis multis crassis, fibris radicalibus carnosis cylindricis. *Folia* haud vidi. *Scapus* subpedalis fragilis purpureo-tinctus. *Racemus* expansus 4–6 poll. longus 1–1¼ poll. diam. pedunculis inferioribus ½–¾ poll. longis; bracteæ membranaceæ 1/12 poll. longæ basi minute calcaratæ. *Perianthium* ⅙ poll. longum segmentis membranaceis dorso late saturate purpureo-vittatis. *Stamina* perianthio distincte breviora filamentis albis linearibus glabris; antheræ parvæ oblongæ luteæ. *Capsula* glabra ¼ poll. longa ⅓ poll. diam. loculis acutis conspicue lateraliter compressis. *Semina* oblonga discoidea ¼ poll. longa.

Socotra. Near Kischen at over 3000 feet altitude. Schweinf. n. 678.

Distrib. Endemic.

This new species is in Schweinfurth's collection, we did not obtain it.

Its nearest ally is *U. anthericoides,* Steinh. (in Ann. Sc. Nat. sér. 2, i. 238; Baker in Journ. Linn. Soc. xiii. (1873), 220), a plant of Algeria which is beauti-

fully figured by Vaillant (in Explor. Sc. de l' Algérie t. 45). The Socotran plant differs from the Algerian by its longer pedicels, spurred bracts, smaller flowers and fewer seeds.

Order LXXVII. COMMELINACEÆ.

A considerable order of tropical and subtropical regions of the world. One of the Socotran genera has the dispersion of the order, the other is restricted to the old world.

1. COMMELINA.*

Commelina, Linn. Gen. n. 62; Benth. et Hook. Gen. Pl. iii. 847.

A large genus widely dispersed in the warmer regions of the globe. The three Socotran species are distributed through tropical Africa and in southern Asia.

1. **C. benghalensis**, Linn. Sp. 60; C. B. Clarke in DC. Monog. Phanerog. iii. 159, and Commel. et Cyrt. Beng. t. 4; Wight Ic. t. 2065.

C. procurrens, Schldl.; Hassk. in Schweinf. Flor. Æthiop. 209.

Socotra. In many localities. B.C.S. n. 651. Schweinf. n. 743.

Distrib. From the Canary Islands through tropical south Africa to India and the eastern Archipelago.

2. **C.** (Heterocarpus) **Forskalæi**, Vahl Enum. 2, 172; Hassk. in Schweinf. Flor. Æthiop. 208; C. B. Clarke in DC. Monog. Phanerog. iii. 168.

Nom. Vern. Kiooka (B.C.S.).

Socotra. About Galonsir and Tamarida and other places. B.C.S. n. 35. Schweinf. n. 742.

Distrib. From Cape de Verde Islands, through tropical Africa and south-west Asia to India.

3. **C.** (Heteropyxis) **albescens**, Hassk. in Schweinf. Flor. Æthiop. 210; C. B. Clarke in DC. Monog. Phanerog. iii. 184; Boiss. Flor. Orient. v. 346.

C. Schimperiana, Hochst. in herb. Schimp. Abyss. n. 1242.
C. multicaulis, Hochst. in herb. Schimp. Abyss. (ed. Hohen.), n. 2268.

Nom. Vern. Gogo (Schweinf.).

Socotra. Near Galonsir and Tamarida. B.C.S. n. 134. Schweinf. n. 444.

Distrib. Abyssinia, Arabia, Scinde, and north-west India.

* To Mr C. B. Clarke I am indebted for the identification of the species in this family.

2. CYANOTIS.

Cyanotis, Don. Prod. Flor. Nep. 45; Benth. et Hook. Gen. Pl. iii. 851.

A moderate genus of the hotter parts of the old world.

C. cristata, Rœm. et Schult. Syst. vii. 1150; C. B. Clarke in DC. Monog. Phanerog. iii. 247, and Commel. et Cyrt. Beng. t. 36; Wight Ic. t. 2082.

Socotra. Near Tamarida. B.C.S. n. 196.

Distrib. Indian Peninsula and Malay, and in Mauritius.

Order LXXVIII. JUNCACEÆ.

A considerable order with the majority of its genera in the southern hemisphere but with some cosmopolitan ones.

JUNCUS.

Juncus, Linn. Gen. n. 437, pro parte; Benth. et Hook. Gen. Pl. iii. 867.

A considerable cosmopolitan genus.

J. maritimus, Lamk. Ency. iii. 264; Kunth Enum. iii. 322; Boiss. Flor. Orient. v. 354; Host. Gram. iii. t. 80.

Socotra. About Galonsir and elsewhere. B.C.S. nn. 132, 312, 316. Schweinf. n. 630.

Distrib. Subtropical and temperate regions of the north hemisphere especially.

Order LXXIX. PALMÆ.

This large order chiefly of the tropics, has on Socotra two generic representatives, both of which are, however, introduced.

1. PHŒNIX.

Phœnix, Linn. Gen. n. 1224; Benth. et Hook. Gen. Pl. iii. 921.

A small genus of palms inhabiting Asia and Africa.

P. dactylifera, Linn. Sp. 1658; Kunth Enum. iii. 255; Mart. Hist. Palm. iii. 257, t. 120.

Socotra. On the banks of streams everywhere planted.

Distrib. Generally cultivated in tropical and subtropical districts.

2. BORASSUS.

Borassus, Linn. Gen. n. 1220; Benth. et Hook. Gen. Pl. iii. 939.

A monotypic African genus, but the species is found widely cultivated in the east. The several species described in this genus are reduced by Bentham and Hooker to one type.

B. flabelliformis, Linn.; Mart. Hist. Palm. iii. 218, tt. 108, 121, 162.
B. æthiopum, Mart. Hist. Palm. iii. 220, 318; Kunth Enum. iii. 223.

Socotra. Occasional. B.C.S. n. 523.

Distrib. Of the genus.

A few individuals of this palm were seen here and there upon the island.

Order LXXX. NAIADACEÆ.

A not very extensive order of fresh and salt waters all over the world. The three Socotran genera have a world-wide distribution.

1. POTAMOGETON.*

Potamogeton, Linn. Gen. n. 174; Benth. et Hook. Gen. Pl. iii. 1014.

A genus including many very variable species, the number of which has, however, been inordinately multiplied. There are three species in Socotra all cosmopolitan, but the Socotran form of one has a limited distribution, being confined to Europe, though reported from Jamaica and Australia.

1. P. natans, Linn. Sp. 182; Kunth Enum. iii. 127; Ach. Rich. Tent. Flor. Abyss. ii. 354; Boiss. Flor. Orient. v. 15,

Sub-sp. plantagineus, Du Croz in Rœm. et Schult. Syst. iii. 504; Gaud. Flor. Helv. i. 471, t. 3; Eng. Bot. t. 1401.

Socotra. B.C.S. n. 152.

Distrib. Of the species—cosmopolitan. Of the sub-species—Europe, Jamaica, Australia?

This seems quite the plant of Du Croz! with the exception of the upper leaves, which are subcoriaceous, these are probably unknown (or extremely rare), the nearest approach to these Socotran specimens are Hungarian from Dr Kováts, but the structure of the leaves leave little doubt (*in the absence of fruit*). The general habit and leaf areolation comes about half-way between typical *P. plantagineus* and Sicilian specimens doubtfully referred to *P. siculus*, Birmi.

The distribution of *P. plantagineus* seems to be bounded in the east by Arabia. A similar instance occurs in *P. densus*, L., which occurs in Greece and then in Armenia, but also extends to north India. *P. plantagineus* is usually supposed to be confined to Europe, but Grisebach has a variety of it from Jamaica, which, *in the absence of fruit*, I have no reason to doubt. And

* To Mr A. Bennett I am indebted for the determination of, and the subjoined notes to the species of this genus.

lately Baron Mueller has sent me a very similar plant (also without fruit) from Australia, which, he says, has very rarely subcoriaceous leaves, but it has only been gathered twice by Professor Wilson.

2. P. fluitans, Roth Tent. Flor. Germ. i. 72; Boiss. Flor. Orient. v. 16; Reichb. Ic. Flor. Germ. vii. t. 49.

Socotra. B.C.S. n. 733.

Distrib. Widely spread in temperate and tropical regions.

Quite the north African (Algeria) form of this plant. There is no fruit, but I think the above is correct. In the substance of the leaf, African specimens are one extreme, European the other, south American coming about half-way between.

2. P. pectinatus, Linn. Sp. 183; Kunth Enum. iii. 137; Ach. Rich. Tent. Flor. Abyss. ii. 354; Boiss. Flor. Orient. v. 18; Eng. Bot. t. 1422.

Socotra. In streams. B.C.S. n. 176.

Distrib. Almost cosmopolitan.

This has just the habit of the east European specimens "from saline lakes" in Hungary, Lithuania, and Caucasus.

Specimens from Austrian Tyrol, gathered by Baron Hauseman and distributed by Huter as "*P. marinus*, L.," match the fruit of the Socotran specimens very nearly. I had called this var. *pseudo-marinus*, but it is perhaps hardly worthy of a varietal name.

2. RUPPIA.

Ruppia, Linn. Gen. n. 175; Benth. et Hook. Gen. Pl. iii. 1014.

A genus of one species subject to some variation, found in salt and brackish waters over nearly the whole world.

R. maritima, Linn. Sp. 184; Kunth Enum. Pl. iii. 123.

R. spiralis, Dumort. Flor. Belg. 164; Boiss. Flor. Orient. v. 19.
R. rostellata, Koch in Reich. Crit. ii. 66, t. 174, f. 306; Boiss. Flor. Orient. v. 20.

Socotra. In streams near Galonsir. B.C.S. n. 445.

Distrib. Of the genus.

I do not find it possible to recognise as distinct the several forms of this plant which have been described as species.

3. NAIAS.

Naias, Linn. Gen. n. 1096; Benth. et Hook. Gen. Pl. iii. 1018.

A small genus of fresh-water plants found over tropical and temperate regions.

1. **N. major,** All. Flor. Ped. ii. 221; Kunth Enum. iii. 112; Boiss. Flor. Orient. v. 27.

N. muricata, Delile Fl. Ægypt. 137, t. 50, f. 1; Boiss. Flor. Orient. v. 27.

Socotra. In streams near Galonsir. B.C.S. n. 732. Schweinf. n. 709.

Distrib. Over the whole world.

2. **N.** (Caulinia), **graminea,** Delile Fl. Ægypt. 138, t. 50. f. 3; Kunth Enum. iii. 115; Boiss. Flor. Orient. v. 28.

Socotra. In streams near Gharriah. B.C.S. n. 731.

Distrib. Old world.

Order LXXXI. CYPERACEÆ.

A very large order of moisture-loving herbs found all over the world. The five Socotran genera have all a wide distribution in tropical countries.

1. CYPERUS.

Cyperus, Linn. Gen. n. 66; Benth. et Hook. Gen. Pl. iii. 1043.

A vast genus of tropical lands, a few species reaching temperate climates. In Socotra it is represented by thirteen species. Of these, five are widely spread tropical ones, seven are old world tropical, though one of them is represented on the island by a distinct variety, the other species is an Arabian one, though by some it is regarded merely as a variety of one of the widespread old world species.

1. **C.** (Pycreus) **pumilus,** Linn. Amœn. Acad. iv. 302; Kunth Enum. ii. 4.
var. **patens,** Benth. Flor. Aust. vii. 258.

C. nitens, Vahl, var. *patens,* Bcklr. in Linnæa xxxv. 484.

Socotra. On the Haghier hills. Not common. B.C.S. n. 475. Schweinf. n. 592.

Distrib. Of the species—through tropical Africa and Asia. Of the variety—tropical Africa and Australia.

2. **C.** (Juncellus) **lævigatus,** Linn. Mant. ii. 179; Bcklr. in Linnæa xxxv. 486; Rottb. Descr. et Ic. Pl. 19, t. 16, f. 1; Boiss. Flor. Orient. v. 366.

Socotra. About Galonsir, abundant. B.C.S. n. 27. Schweinf. n. 779.

Distrib. Moist sandy places all through the tropics.

The Socotran plants have the glumes all pale coloured.

3. C. amabilis, Vahl Enum. ii. 318; Kunth Enum. ii. 108.

C. aureus, H. B. K. Nov. Gen. i. 205; Kunth Enum. ii. 21; Bcklr. in Linnæa xxxv. 494.
C. lepidus, Hochst. in herb. Kotsch. Nub. n. 139.

Socotra. Near Adona on the Haghier hills at a high altitude. B.C.S. n. 453.

Distrib. Tropics of both the old and new worlds.

4. C. aristatus, Rottb. Descr. et Ic. 23, t. 6, f. 1; Kunth Enum. ii. 23; Ach. Rich. Tent. Flor. Abyss. ii. 478; Bcklr. in Linnæa xxxv. 500.

Socotra. Near Tamarida. B.C.S. n. 362.

Distrib. Tropical and subtropical regions of the old and new worlds.

5. C. rubicundus, Vahl Enum. ii. 308; Kunth Enum. ii. 49; Bcklr. in Linnæa xxxv. 507.

C. serra, Ach. Rich. Tent. Flor. Abyss. ii. 479 (fid. spec. n. 603, in Schimp. herb. Abyss. ed. herb. Mus. Par.).

Socotra. Near Galonsir. B.C.S. n. 106.

Distrib. South and tropical Africa and India.

Our specimens of this species are interesting as they possess very narrow flagelliform leaves which are commonly coiled at the extremity.

6. C. compressus, Linn. Sp. 68; Kunth Enum. ii. 23; Bcklr. in Linnæa xxxv. 517; Boiss. Flor. Orient. v. 372; Rottb. Descr. et Ic. Pl. 27, t. 9, f. 3.

Nom. Vern. Korzha (B.C.S.).

Socotra. On the Haghier hills south from Tamarida. B.C.S. n. 375.

Distrib. Tropics and subtropical regions of both old and new worlds. Not reported from many localities in tropical Africa.

7. C. proteinolepis, Bcklr. in Linnæa xxxv. 522, pro parte (non Steud.).

C. proteinolepis, Steud. var. pro parte.
C. conglomeratus, Hochst. in herb. Schimp. Arab. sect. i. nn. 301, 733 (non Roth).

Socotra. Near Galonsir. B.C.S. n. 105.

Distrib. Arabia, Jeddah (Zohrab n. 22; Fischer n. 55; Schimper n. 810, partim), Aden (Thomson, Perry), El Hami (Schweinf. n. 210).

var. major, Balf. fil.: omnino majora.

C. conglomeratus, var. *major*, Bcklr. in Linnæa xxxv. 544.

Socotra. Nimmo.

Distrib. Arabia (Ehrenb., Schimp. nn. 301, 733), Aden (Thomson, Hooker), Upper Egypt (Parlatore).

Nimmo's plant in Kew Herbarium is the large and strong form of the species with long spikes.

For remarks regarding this species see under the following one.

8. **C. conglomeratus**, Rottb. Descr. et Ic. 21, t. xv. f. 7; Bcklr. in Linnæa xxxv. 543 (excl. *β major*); Boiss. Flor. Orient. v. 369 (excl. *γ arenarius* and syn. *C. Aucheri*, Jaub. et Spach., and *C. macrorhizus* Nees).

var. **socotranus**, Balf. fil. in Trans. Roy. Soc. Edin. xii. (1883), 411.

Culmo rigido erecto vix pollicari subcompresso striato; foliis $1\frac{1}{2}$ poll. longis culmo longioribus substrictiusculis a basi canaliculatis apice supra subplanis subtus carinatis; fasciculo spicarum solitario apicali sessili tribracteato 2–6-stachyo, bracteis inæqualibus spicis brevioribus; spicis teretibus $\frac{1}{3}$ poll. longis $\frac{1}{16}$ poll. latis squamis arcte imbricatis ellipticis obtusis mucronatis paullo convexis superne carinulatis multinervatis basi fuscis.

Socotra. Near Galonsir. B.C.S. n. 91.

DISTRIB. Of the species—north-east Africa through south-west Asia to Beloochistan and Affghanistan. Of the variety—endemic.

This species, of which we have a very distinct variety in Socotra, is one which is not a little protean, and there has been considerable confusion regarding its nomenclature and multiplication of specific names for its forms. The confusion is due in some part to the fact that in Schimper's Arabian Herbarium (sect. i.), two plants which are distinct and recognisable have been distributed under the same number—n. 810. One of these is *C. conglomeratus*, Roth, the other is the species last mentioned from Socotra, *C. proteinolepis*, Bcklr. This latter is quite as variable as the former, and it will be evident that thereby a very complicated condition of the nomenclature might arise, and indeed it has arisen. This is the conclusion to which I am led by a careful examination of the specimens in the Kew Herbarium.

Of each species one may recognise three distinct conditions. A dwarf form, in which the plant is very small, compact, and tufted, with short leaves and short culms terminating in few spikelets not forming an umbel, the spikelets are usually short and the leaves often exceed in length the inflorescence. Then we have a medium form which might be considered the type. And lastly a large form with all the parts increased in size and the umbels and size of the spikelets usually great. Each one of these states presents deviations in one way or another, and thus a multiplicity of varieties are produced. But throughout the whole it is possible to discriminate the two species by the character of the spikelets. In *C. conglomeratus* they are narrow, hardly compressed, fewer flowered, and with the bracts more open and separate and not so closely imbricate, whilst in *C. proteinolepis* they are broader, flattened, the scales closely imbricate, and many more in number (relatively), and frequently

these are nearly quite obtuse. Working upon such a basis the synonymy of Rottboll's species is as follows :—

C. conglomeratus, Rottb. (ref. ut supra).
C. proteinolepis, Steud. Syn. ii. 15 (cum varietate pro parte).
C. conglomeratus, var. *pumila*, Hochst. in herb. Schimp. Arab. sect. i. n. 810.
C. curvulus, Bcklr. in Linnæa xxxv. 541=[*C. proteinolepis*, var. Steud. (pro parte)].
C. arcuatus, Bcklr. *loc. cit.* 542.
C. falcatus, Nees et Ehrenb. in hort. Berol.; Bcklr. in Linnæa xxxv. 546=[*C. conglomeratus* β *effusus*, Boiss. (præcipue)].
C. pungens, Bcklr. *loc. cit.* 537 (?);

and its distribution is pretty extensive,—Cairo (Bové n. 281); Nubia (Kotschy n. 21, Petherick); Kordofan (Pfund. nn. 245, 246); Korjonis (Kotschy n. 20); Hanish Id. (Slade n. 8); Jeddah (Zohrab n. 13; Schimper n. 810, partim); Aden (Hooker, Thomson, Perry); Beloochistan (Pierce); Affghan. (Griffith n. 6146); Centr. Afr. (Schweinf. n. 645); El Hami (Schweinf. n. 204); Dongola (Ehrenb.). These are the localities from which I have seen specimens in Kew Herbarium.

It appears that Steudel founded his species *C. proteinolepis* upon Kotschy's Nubian plant, n. 21. That is unquestionably *C. conglomeratus*, Rottb. But the variety he mentions there is *C. conglomeratus*, Hochst. *var. pumila*, n. 810 of Schimper's Arabian Herbarium. Here, as I have already mentioned, are two plants both dwarf forms. One is undoubtedly of *C. conglomeratus*, Rottb. (and is the type of Böckeler's *C. curvulus*), the other has caused most of the confusion. It is the dwarf form of the species described by Böckeler as *C. proteinolepis*, Steud. (*var. excl.*), under which he quotes Kotschy's Nubian n. 21 and Schimper's Arabian n. 301. Now Steudel's species and Kotschy's plant are, I have pointed out, *C. conglomeratus*, Rottb., which species Böckeler recognises, but Schimper's n. 301 is the same as the second dwarf plant of Schimper's n. 810. Böckeler's description of *C. proteinolepis* fits very fairly this plant, and on every ground I think we may assume this to be the plant he meant, but it is not Steudel's plant. In taking this specific name then, as we have done in the last species, we assign it to Böckeler. The only part of Steudel's plant included is a portion of the variety, viz., the second dwarf plant under Schimper's n. 810. Böckeler's *C. arcuatus* is a slight variation from the dwarf condition of the species which he made a new species *C. curvulus*, and *C. falcatus* is a state represented in a few localities (from the three last mentioned I have seen specimens) with longish narrow slender spikes and very long bracteoles. *C. pungens* is probably also a stout form of the species.

Recently Boissier (Flor. Orient. v. 369) has considered all those forms to which I have referred as variations of one protean species for which he retains Rottboll's nomenclature, and in addition adds as varieties *C. arenarius*, Retz. and

C. Aucheri, Jaub. et Spach. Now, whilst there may be a question as to whether it is possible to find good specific distinctions between the forms I have kept here separate, there is no doubt that *C. arenarius* is quite a true species, having rhizome of a different character, and it also differs in habit. *C. Aucheri* is also a species which in many features is entirely distinct from *C. conglomeratus*, Rottb.

From Socotra we have not the type, but a dwarfed form, which differs from all hitherto described in its short narrow spikes, few flowers, and wide, closely-set bracts. *C. curvulus* and *C. arcuatus* it most resembles.

9. **C. difformis**, Linn. Sp. 67; Kunth Enum. ii. 38; Bcklr. in Linnæa xxxv. 586; Boiss. Flor. Orient. v. 370; Rottb. Descr. et Ic. 24, t. ix. f. 2; Sibth. Flor. Græc. t. 46.

Socotra. Near Tamarida. B.C.S. n. 171.

Distrib. Widely distributed in tropical and subtropical regions. Not common in Africa.

10. **C.** (Papyrus) **Tegetum**, Roxb. Flor. Ind. i. 208.

C. elongatus, Sieber in herb. Schimp. Abyss. sect. iii. n. 1994.

C. longus, Hochst. in herb. Schimp. Abyss. sect. i. n. 57; Ach. Rich. Tent. Flor. Abyss. ii. 484.

C. Schimperianus, Steud. Syn. ii. 34.

Socotra. Near Galonsir. B.C.S. n. 284.

Distrib. India and north-east tropical Africa.

We have a fragmentary specimen which appears to be this species.

11. **C.** (Papyrus) **tenuiflorus**, Rottb. Descr. et Ic. Pl. 30, t. xiv. f. 1 (non Jacq.).

Socotra. On the banks of the stream at Katheng. Schweinf n. 691.

Distrib. India, Mascarene Islands, and tropical Africa. Possibly merely a variety of *C. rotundus*, Linn. (Benth.).

12. **C.** (Papyrus) **rotundus**, Linn. Sp. 67; Kunth Enum. ii. 58; Ach. Rich. Tent. Flor. Abyss. ii. 482; Bcklr. in Linnæa xxxvi. 283; Boiss. Flor. Orient. v. 376.

C. hexastachyus, Rottb. Descr. et. Ic. Pl. 28. t. xiv. f. 2.

Socotra. Near Galonsir. B.C.S. n. 31. Schweinf. n. 707.

Distrib. Tropical and temperate regions of the whole world.

A very variable species, to which, possibly, the last-mentioned species may be referred as a variety. Very difficult to distinguish from *C. longus*, into which it appears to pass.

13. **C.** (Mariscus) **umbellatus**, Benth. Flor. Hongk. 386.

Mariscus umbellatus, Vahl Enum. ii. 376; Kunth Enum. ii. 118.

Kyllingia umbellata, Rottb. Descr. et Ic. Pl. 15, t. iv. f. 2; Beauv. Flor. d'Ow. et Ben. t. 55.

var. **cyperinus**, Balf. fil.

M. cyperinus, Vahl Enum ii. 377.

Socotra. Near Tamarida. B.C.S. n. 437.

Distrib. Tropical Africa and Asia, and in Australia. This form "differs somewhat in the very broad wings of the rhacheola, which envelope the nut" (C. B. Clarke).

2. KYLLINGA.

Kyllinga, Rottb. Descr. et Ic. Pl. 12, t. iv; Benth. et Hook. Gen. Pl. iii. 1045.

A considerable genus of badly defined species, distributed in the warmer regions of the globe.

K. monocephala, Rottb. *loc. cit.*; Kunth Enum. ii. 129; Bcklr. in Linnæa xxxv. 427.

Socotra. Common. B.C.S. n. 426. Schweinf. nn. 356, 465.

Distrib. Tropical Africa and Asia.

3. HELEOCHARIS.

Heleocharis, R. Br. Prod. 224 (*Elebcharis*); Benth. et Hook. Gen. Pl. iii. 1047.

A considerable genus dispersed all over the globe. Both Socotran species are forms of wide distribution in the tropics.

1. **H.** (Heleogenus) **Chætaria**, Rœm. et Schult., Syst. ii. 154; Kunth Enum. ii. 140; Bcklr. in Linnæa xxxvi. 428.

Socotra. Near Tamarida. B.C.S. n. 467.

Distrib. Tropical Asia, Africa, and America; also Australia. Seldom reported from tropical Africa.

2. **H.** (Heleogenus) **capitata**, R. Br. Prod. 225; Kunth Enum. ii. 150; Bcklr. in Linnæa xxxvi. 461; Boiss. Flor. Orient. v. 387.

Socotra Abundant on the sandy banks of streams. B.C.S. n. 730. Schweinf. nn. 228, 693.

Distrib. Widely spread over the warmer regions of the globe.

4. FIMBRISTYLIS.

Fimbristylis, Vahl Enum. ii. 285; Benth. et Hook. Gen. Pl. iii. 1048.

A very large genus, spread everywhere in the tropics, more sparsely found in temperate regions. Of five species in Socotra, four are widely dispersed over the globe, and the fifth is a tropical African form.

1. **F.** (Dichelostylis) **diphylla**, Vahl Enum. ii. 289.

F. laxa, Vahl *loc. cit.* 292; Boiss. Flor. Orient. v. 389.

F. communis, Kunth Enum. ii. 234.

F. polymorpha, Bcklr. in Linnæa xxxvii. 14.

Scirpus annuus, All. Pedem. ii. 271, t. 88, f. 5.

Socotra. On the Haghier hills at various altitudes. B.C.S. n. 407. Schweinf. nn. 591, 778.

DISTRIB. Tropics of both old and new worlds.

2. **F.** (Dichelostylis) **ferruginea**, Vahl Enum. ii. 291; Kunth Enum. ii. 236; Bcklr. in Linnæa xxxvii. 16; Boiss. Flor. Orient. v. 388; Delile Fl. Ægypt. t. 6, f. 3.

Socotra. Common. B.C.S. nn. 314, 469, 499, 500. Schweinf. n. 421.

DISTRIB. Round the world in the tropics.

3. **F.** (Trichelostylis) **hispidula**, Kunth Enum. ii. 227; Bcklr. in Linnæa xxxvii. 27.

F. oligostachys, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1268; Ach. Rich. Tent. Flor. Abyss. ii. 505.

Isolepis (Trichelostylis) *pubiculmis*, Hochst. in herb. Schimp. Abyss. ed. Hohenack. n. 2165.

Socotra. At Galonsir and Tamarida. B.C.S. nn. 120, 294.

DISTRIB. Tropical Africa.

4. **F.** (Trichelostylis) **autumnalis**, Rœm. et Schult Syst. ii. 97; Kunth Enum. ii. 227; Bcklr. in Linnæa xxxvii. 38.

F. complanata, Link Hort. Berol. i. 292; Kunth Enum. ii. 228; Ach. Rich. Tent. Flor. Abyss. ii. 505.

Socotra. On Haghier. B.C.S. n. 279.

DISTRIB. Tropics of both worlds. Not widely spread in tropical Africa. Our plant is a very slender form of the species.

5. **F.** (Trichelostylis) **glomerata**, Nees ab Essenb. in Linnæa ix. 290; Kunth Enum. ii. 246; Bcklr. in Linnæa xxxvii. 47.

F. rigida, Kunth Enum. ii. 231.

Socotra. Abundant. B.C.S. nn. 33, 310. Schweinf. n. 620.

DISTRIB. Tropics and warmer regions of both old and new worlds.

5. FUIRENA.

Fuirena, Rottb. Descr. et Ic. Pl. 70, t. xix. f. 3; Benth. et Hook. Gen. Pl. iii. 1053.

A small genus dispersed over the warmer regions of the whole globe.

F. glomerata, Lamk. Ill. i. 150; Kunth Enum. ii. 184; Bcklr. in Linnæa xxxvii. 107.

Scirpus ciliaris, Linn. Mant. 182; Rottb. Descr. et Ic. Pl. 55, t. xvii, f. 1.

Socotra. On Haghier. B.C.S. n. 839.

DISTRIB. Tropical Africa and Asia.

6. CLADIUM.

Cladium, P. Br. Hist. Jam. 114; Benth. et Hook. Gen. Pl. iii. 1065.

A small genus spread all over the world, but with headquarters in Australia.

C. mariscus, R. Br. Prod. 236; Kunth Enum. ii. 303; Bcklr. Linnæa xxxviii. 232; Boiss. Flor. Orient. v. 392; Reichb. Ic. Flor. Germ. 8, t. 287.

NOM. VERN. Ouref.

Socotra. Near Tamarida. B.C.S. n. 387. Schweinf. n. 547.

DISTRIB. All over the world.

Order LXXXII. GRAMINEÆ.

This extensive family is represented in Socotra by more genera than any other in the flora. There are twenty-eight genera, and the greater number of these are widely spread in tropical and subtropical regions, several including common weeds of cultivation. The only genera of limited distribution that deserve mention here are the endemic *Ischnurus;* the Abyssinian and Æthiopian *Rhynchelytrum;* *Æleuropus*, which extends from the Mediterranean region to India; *Melanocenchris*, a tropical African and Asian genus; *Arthraxon*, with a chiefly Indian distribution; and *Lepturus* which is mainly north temperate but is also found in Australia and the Pacific islands. Of the others two or three only are confined to the old world.

1. PASPALUM.

Paspalum, Linn. Gen. n. 75; Benth. et Hook. Gen. Pl. iii. 1097.

A very large genus, widely dispersed in tropical and subtropical regions, and most abundant in America.

1. P. scrobiculatum, Linn. Mant. 29; Kunth Enum. i. 53; Trin. Spec. Gram. ii. t. 143.

Socotra. Near Galonsir. B.C.S. n. 305.

DISTRIB. Tropical Asia and Africa.

2. P. distichum, Linn. Sp. 82; Kunth Enum. i. 52.

P. vaginatum, Sw. Flor. Ind. Occ. i. 535.

Socotra. At Galonsir. B.C.S. n. 236. Schweinf. n. 717, pro parte.

DISTRIB. Tropics of both old and new worlds.

2. ERIOCHLOA.

Eriochloa, H. B. et K. Nov. Gen. et Sp. i. 94, tt. 30, 31; Benth. et Hook. Gen. Pl. iii. 1099.

A small tropical genus occurring in both the old and new worlds.

E. vestita, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 97.

Omnino molliter pubescens rigide ramosa; foliis crassiusculis rigidis brevibus; racemis paniculæ 6–8; spiculis compressis ovoideis; glumis vacuis villosis pungentibus; glumis fertilibus muticis.

Rami culmiformi rigidi a collo cæspitosi erecti arcte aggregati inferne simplices superne dichotome rigide ramosi et inter se intricati $\frac{1}{3}$–$\frac{1}{2}$ poll. longi obscure tetragoni molliter pubescentes. *Folia* in parte inferiore ramorum subsquamiformia late ovata amplexicaulia apiceque pungente-mucronata sursum gradatim in folia vaginantia transeuntia, folia typica molliter pubescentia arcte imbricata lamina 1–1$\frac{1}{2}$ poll. longa lineari longe acuta supra canaliculata infra convexa striata involuta crassiuscula subrigida vagina striata sæpe 1 poll. longa. *Panicula* ad extremitatem pedunculi communis brevis. *Racemi* 5–7 tenues flexuosi pauciflori adpresso-erecti secundi alterni remoti teretes molliter pubescentes ad axem communem striatum v. sulcatum flexuosum pubescentem 1–1$\frac{1}{4}$ poll. longum dispositi inferiores $\frac{1}{4}$ poll. longi sursum breviores. *Spiculæ* compressæ subovoideæ subacutæ $\frac{1}{10}$ poll. longæ ad discum annulatum cupulatum sessæ basi articulatæ. *Glumæ* vacuæ submembranaceæ late ovatæ et apice pungente-apiculatæ multi-nerves carinatæ extus dense villosæ. *Glumæ* fertiles breviores ovatæ acutæ muticæ coriaceæ nitidæ obscure nervosæ.

Socotra. On the limestone plains south-west of Galonsir, at an altitude over 1500 feet. B.C.S. n. 574.

Distrib. Endemic.

A very distinct species in this genus, distinguished by its soft downy vestiture as well as by its habit. It grows in patches extending over a considerable area, and with the stems and branches close set and intermingling, so that it forms a complete carpet on the surface of the ground. From this carpet the flowering panicles ascend here and there, and the panicles which are borne by them differ from those in other members of the genus in having the flowers distinctly pedicellate. The type of the genus shows sessile flowers, but in some species there is a slight pedicellation of the flowers. Possibly *E. punctata*, Hamilt. (Prod. Pl. Ind. Occ. 5; Kunth Enum. i. 72), is its nearest ally.

3. PANICUM.

Panicum, Linn. Gen. n. 76; Benth. et Hook. Gen. Pl. iii. 1100.

A large genus, dispersed widely in the warmer regions of the whole globe, some species being almost cosmopolitan and a few occurring in north temperate regions. Nine species are Socotran. Of these, one is endemic, two are north-east tropical African, one is tropical African and Arabian, two are tropical African and Asian one of them reaching Australia, two are generally distributed tropical species, and one is almost a cosmopolitan weed.

1. P. (Digitaria) **sanguinale**, Linn. Sp. 84; Kunth Enum. i. 82; Trin. Sp. Gram. ii. tt. 93, 144.

P. ciliare, Retz. Obs. iv. 16; Ach. Rich. Tent. Flor. Abyss. ii. 360.

P. fenestratum, Hochst. in herb. Schimp. Abyss. sect. i. n. 85; Ach. Rich. *loc. cit.* 361.

P. macrostachyum, Hochst. in herb. Schimp. Abyss. ed. Hohenack. n. 2162.
P. psilostachyum, Hochst. in herb. Schimp. Abyss. ed. Hohenack. n. 2256.

Socotra. Common. B.C.S. nn. 128, 203, 234.

Distrib. Cosmopolitan weed.

A very variable plant in length and stoutness of inflorescence, and in size and clothing of bracts. In Socotra both a large form with somewhat ciliate glumes and a very small delicate form occur. The latter being sometimes pilose throughout, in other instances having glabrous stems. In these smaller examples the spikes are very commonly reflexed.

2. P. (Brachiaria) **paspaloides**, Pers. Syn. i. 81; Kunth Enum. ii. 77; Webb et Berthelot Phyt. Canar. t. 245.

Socotra. Near Galonsir and elsewhere. B.C.S. nn. 225, 323. Schweinf. n. 689.

Distrib. Tropics generally.

3. P. (Brachiaria) **eruciforme**, Sibth. Flor. Græc. i. t. 59; Kunth Enum. i. 78; Fig. et De Not. Agrostog. Ægypt. Fragm. ii. 17.

P. Wightii, Nees ab Esenb. Ill. Flor. Afr. Aust. 29; Ach. Rich. Tent. Flor. Abyss. ii. 364.

Socotra. Near Tamarida. B.C.S. n. 337.

Distrib. Tropical Asia and Africa.

4. P. (Echinochloa) **colonum**, Linn. Sp. 84; Trin. Sp. Gram. ii. t. 160; Fig. et De Not. Agrostog. Ægypt. Fragm. ii. 22, t. xii.

Oplismenus colonus, Kunth Enum. i. 142.

Socotra. Abundant. B.C.S. n. 563.

Distrib. Tropics of the old and new worlds. Common.

5. P. **turgidum**, Forsk. Flor. Ægypt. Arab. 18; Kunth Enum. ii. 97; Delile Fl. Ægypt. 19, t. 9, f. 2; Fig. et De Not. Agrostog. Ægypt. Fragm. ii. 38; Trin. Sp. Gram. ii. t. 227.

Socotra. Abundant near Galonsir. B.C.S. n. 75. Schweinf. n. 717, pro parte.

Distrib. Arabia, Egypt, and perhaps Senegambia. Specimens in Kew Herbarium from Senegambia may be this species.

6. P. **Petiveri**, Trin. Sp. Gram. ii. t. 176; Kunth Enum. i. 91.

Socotra. Very common. B.C.S. nn. 23, 51, 67, 127. Schweinf. n. 429.

Distrib. Tropical Africa, Asia, and Australia.

A very variable species, sometimes dwarf, from other localities a large stout plant. The amount of hairiness varies too very greatly.

7. P. **nudiglume**, Hochst. in herb. Schimp. Abyss. sect. iii. n. 1612; Ach. Rich. Tent. Flor. Abyss. ii. 372.

P. bispiculatum, Hochst. in herb. Schimp. Abyss. et Hohenack. n. 2143.

Socotra. Wadi Digal and Kischen. Schweinf. nn. 509, 584.

Distrib. Abyssinia and Egypt.

var. **major**, Hochst. in herb.

Socotra. Near Galonsir. B.C.S. n. 47.

Distrib. Abyssinia.

This name is given by Hochstetter to a much more hairy form than the type; there are long hairs on the panicles. The glumes on the Socotran plant are more glistening and smooth than in Abyssinian specimens.

8. P. **atrosanguineum**, Hochst. in herb. Schimp. Abyss. sect. iii. n. 1709; Ach. Rich. Tent. Flor. Abyss. ii. 375.

Socotra. On Haghier. B.C.S. n. 280. Schweinf. n. 697.

Distrib. Abyssinia.

Ours is a dwarf specimen, very hairy, and Schweinfurth's is an almost glabrous example, with somewhat longer spikelets than usual.

9. P. **rigidum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 97.

Cæspitosum ramis decumbentibus radicantibus ad nodos villosis; foliis brevibus rigidis ad apicem vaginæ villosis; paniculis laxis ramis ramosis plerumque glabris; spiculis omnibus pedicellatis; gluma extima brevissima, glumis interioribus 2 subæqualibus 5-nervatis glabris obtusis, gluma florali levi obtusa.

Cæspitosum radicibus numerosis fibrosis culmisque plurimis a collo orientibus radiantibus longe patentibus decumbentibus ad nodos radicantibus subanfractuosis rigidis glabris nodis villosis exceptis glaucis. *Folia* inferiora in herbis majoribus lamina 2 poll. longa $\frac{1}{5}$ poll. lata ensiformi vagina longa striata in minoribus subsquamiformi brevi, superiora spiculiformia angusta crassa rigida acutissima valde involuta et sicca subtereta glabra striata patentia sub 1 poll. longa vaginaque non perfecte amplexicauli brevi sub lamina villosa. *Paniculæ* effusæ erectæ $1\frac{1}{2}$–2 poll. longæ 6–8-ramosæ, rhachi primaria et secundariis glabris v. obscure puberulis, ramis tenuibus subflexuosis ramosis infimis sæpe $1\frac{1}{2}$ poll. longis subdistantibus ultimis 3–5-floris. *Spiculæ* ellipsoideæ subglobosæ minutæ $\frac{1}{12}$ poll. longæ omnes pedicellatæ, pedicellis $\frac{1}{8}$–$\frac{1}{6}$ poll. longis. *Gluma* extima minor late ovata apice deltoideo-acuta concava subscaphoidea carinata uninervis membranacea medio nervo viridi spiculâ $\frac{2}{3}$ brevior; gluma secunda tertiæ florenti subæqualis et eâ conformis elliptica concava obtusa obscure apiculata membranacea nervis 5 rarissime 7 viridibus prominulis glabris; palea elliptica lata obtusa sed apice angustata levis.

Socotra. Near Galonsir, Tamarida, and elsewhere. B.C.S. nn. 130, 561. Schweinf. n. 346.

Distrib. Endemic.

A very Isachnoid species, but a true *Panicum*, unidentifiable with any species hitherto described, and distinguished especially by its habit and stiff foliage. On sandy spots it forms a close-set tufted plant, as in our n. 130, but

on better soil the branches spread out, often to about two feet in length, as in our n. 561.

4. OPLISMENUS.

Oplismenus, Beauv. Flor. d'Ow. et Ben. ii. 14, t. 63, and Agrostog. 53, t. 11, f. 3; Benth. et Hook. Gen. Pl. iii. 1104.

A small genus, dispersed widely in tropical and subtropical regions.

1. O. Burmanni, Beauv. Agrostog. 54; Kunth Enum. i. 139.

O. multisetus, Ach. Rich. Tent. Flor. Abyss. ii. 377.
Panicum Burmanni, Retz. Obs. iii. 10; Trin. Sp. Gram. ii. t. 193.
P. multisetum, Hochst. in herb. Schimp. Abyss. sect. iii. n. 1469.

Socotra. Common. B.C.S. n. 295. Schweinf. n. 422.
DISTRIB. Round the world in the tropics.

2. O. compositus, Beauv. Agrostog. 54.

Panicum compositum, Linn. Sp. 84; Trin. Sp. Gram. ii. tt. 187, 188, 190.

Socotra. In Wadi Digal. Schweinf. n. 587.
DISTRIB. Common in the tropics.

5. SETARIA.

Setaria, Beauv. Flor. d'Ow. et Ben. ii. 80, quoad char. gen. non t. 110; Benth. et Hook. Gen. Pl. iii. 1105.

A cosmopolitan small genus of badly defined species, some of which are amongst the commonest of weeds.

1. S. glauca, Beauv. Agrostog. 51; Kunth Enum. i. 149; Reichb. Ic. Flor. Germ. i. t. 47.

S aurea, Hochst. in herb. Schimp. Abyss. sect. i. n. 409.
Panicum glaucum, Linn. Sp. 83; Trin. Sp. Gram. ii. t. 195.
P. chrysanthum, Steud. Syn. 50; Oliv. in Trans. Linn. Soc. xxix. 172.
Pennisetum glaucum, R. Br. Prod. 195; Ach. Rich. Tent. Flor. Abyss. ii. 377.
P. aureum, Ach. Rich. *loc. cit.* 378.

Socotra. Abundant. B.C.S. n. 287.
DISTRIB. Everywhere in the tropics.

2. S. viridis, Beauv. Agrostog. 51; Kunth Enum. i. 151; Reichb. Ic. Flor. Germ. i. t. 47.

Panicum viride, Linn. Sp. n. 83; Trin. Sp. Gram. ii. t. 203.

Socotra. Not uncommon. B.C.S. n. 571.
DISTRIB. Tropics, but not so common as the other mentioned.

3. **S. verticellata,** Beauv. Agrostog. 51; Kunth Enum. i. 152; Reichb. Ic. Flor. Germ. i. t. 47.

Panicum verticillatum, Linn. Sp. 82; Trin. Spec. Gram. ii. t. 202.
P. respiciens, Hochst. in herb. Schimp. Abyss. sect. iii. n. 1654.
Pennisetum respiciens, Ach. Rich. Tent. Flor. Abyss. ii. 379.

Socotra. Near Galonsir. B.C.S. n. 53.

DISTRIB. Tropical weed of cultivation.

6. CENCHRUS.

Cenchrus, Linn. Gen. n. 1149, pro parte; Benth. et Hook. Gen. Pl. iii. 1105.

A small genus of wide distribution in the tropics of the world.

C. Schimperi, Hochst. et Steud. in herb. Schimp. Arab. sect. i. n. 796.

C. montanus, Nees in Royle Illustr. Himal. 416, absque descr. fide Steud. Syn. Glum. i. 111.
C. tripsacoides, R. Br. in App. Salt Abyss. (fide Steud.).
C. bulbifer, Hochst. in herb. Schimp. Abyss. ed. Hohenack. n. 2196.

Socotra. Abundant, B.C.S. nn. 66, 123, 235.

DISTRIB. Tropical Africa, Arabia, and India.

This plant occurs in both a dwarf and a large state. The dwarf, which is the typical Arabian form, is common on Socotra.

7. PENNISETUM.

Pennisetum, Pers. Syn. i. 72; Benth. et Hook. Gen. Pl. iii. 1105.

A considerable genus with its headquarters in Africa, but extending through the tropics of both old and new worlds. One of the Socotran plants is cosmopolitan in the tropics, the other is an old world form.

1. **P. dichotomum,** Delile Fl. Ægypt. 15, t. 8, f. i.; Kunth Enum. i. 161.

NOM. VERN. Kassāde (Schweinf.).

Socotra. Common. B.C.S. nn. 232, 251. Schweinf. n. 456.

DISTRIB. North-east tropical Africa and south-west Asia.

A very variable species in its flowering spikes, which has given rise to a copious synonymy. Delile's plant may be taken as a centre around which a number of other forms group themselves. Our plant differs from the type in the pubescent rhachis of the flower-spike, and it resembles, according to Schweinfurth, *P. spectabilis,* Fig. and De Not. (Agrostogr. Ægypt. Frag. i. 248), from which, however, it is excluded by the length of the glume. With *P. tiberiades,* Boiss. (Diagn. i. 13, 43), it agrees well, but from it again its hairy rhachis differentiates it.

2. **P. cenchroides,** Pers. Syn. i. 72; Kunth Enum. i. 162; Ach. Rich. Tent. Flor. Abyss. ii. 384.

Socotra. Very common. B.C.S. n. 44. Schweinf. n. 559.
DISTRIB. Warmer regions of both old and new worlds.

8. RHYNCHELYTRUM.

Rhynchelytrum, Hochst. in Flora 1844, 249, non Nees; Benth. et Hook. Gen. Pl. iii. 1120.

A small genus including one Abyssinian and one Æthiopian species, and now an additional one endemic in Socotra which shows two distinct forms.

R. microstachyum, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 97. Tab. XCVIII, A.

Vix pedale plus minusve puberulum tenue; paniculi parvi spiculis $\frac{1}{5}$ poll. longis; glumis secundis et tertiis apice bifidis lobis rotundatis aristis glumis vix excedentibus.

Subpedalis radicis fibrosis paucis, culmis paucis erectis tenuibus basi internodiis brevibus puberulis sericeis teretibus substriatis. *Folia* puberula subtusque subscabridula, nonnunquam pilosa basalia amplexicaulia vix vaginantia basi carinata antice canaliculata longe ensiformia angusta acuta, superiora vagina subventricosa striata, lamina $1\frac{1}{2}$–2 poll. longa $\frac{1}{8}$ poll. lata sicca involuta margine ciliata subtus nervo medio per $\frac{2}{3}$ inferiorem prominente utrinque 3-nervis, ligulæ loco pilosa. *Paniculi* 2–$2\frac{1}{2}$-pollicares rhachi striata puberula tenui; rami distantes delicatuli, inferiores longissimi $\frac{3}{4}$–1 poll. ramosi ramulis ultimis 2–3-floris; pedicelli graciles flexuosi reflexi $\frac{1}{12}$–$\frac{1}{6}$ poll. longi subtiliter puberuli apiceque pilosi et in geniculum orbicularem a spicula solubilem incrassati. *Spiculæ* parvæ $\frac{1}{5}$ poll. longæ secundæ. *Glumæ* infima $\frac{1}{16}$ poll. longa vix tertiam imbricans cum rhachilla pilorum purpurascentium fasciculis basi cincta linearis apice truncata breviter biloba lobis rotundatis extus strigulosa; gluma secunda vacua maxima carinata inferne subcompressa subventricosa lagenæformis v. ovata apice angustata fulvo-colorata bifida crustacea 5-nervis nervis extus prominulis medio cristato margine ciliata intus nitida pilis rigidis erectis cæteroquin puberula pilis subadpressis paucis, arista $\frac{1}{5}$ poll. longa recta puberula pilis ascendentibus; gluma tertia florens paullo minor aristata carinata sed non cristata non ventricosa cæteroquin secundæ simillima; palea ♂ fovens gluma florali brevior $\frac{1}{8}$ poll. longa membranacea binervis margine inflexa nervis puberulis apice bidentula; glumæ 2 superiores parvæ inferior vacua major $\frac{1}{10}$ poll. longa late ovata v. elliptica apice emarginata membranacea 5-nervis superior florem ♀ fovens anguste ovata v. elliptica membracea 2-nervis. *Stamina* 3. *Styli* fere ad basim soluti.

Socotra. About Galonsir and Tamarida. B.C.S. n. 254.
DISTRIB. Endemic.

var. **albicomum**, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1883), 411.

Spiculis paullo majoribus glumisque tribus exterioribus dense pilis albis sericeo-piloso-villosis.

Socotra. Near Galonsir and Tamarida. B.C.S. n. 124. Schweinf. n. 467.
DISTRIB. Endemic.

A very interesting genus belonging to a but little known genus of Tristegineæ, and allied to *Arundinella* and its neighbours. It is, however, readily distinguished by the small distant lowest glume. With Kotschy's Nubian plant, *R. grandiflorum*, Hochst. (in Flora 1844, 249), our plant has many resemblances,

indeed is very closely allied, but is altogether a smaller and more delicate species, with also a few technical differences. In Schimper's Abyssinian herbarium (ed. Hohenacker), a specimen, n. 2310, is by Bentham (*loc. cit.*) rightly separated from *R. grandiflorum*, under which name it has been sent out, having smaller spikelets and shorter awns. In these characters it approaches our plant, from which it principally differs in its larger stature and less puberulent coating. Possibly it may prove to be the same plant as ours, but the material is too poor for an identification at present.

Our plant exhibits two forms. One I have taken as the type wherein the second and third glumes have a small dorsal crest, and the sides slightly strigulose, the other, which I have named as a variety, having these glumes thickly covered with long white silky hairs, and the dorsal crest thick and large.

9. TRAGUS.

Tragus, Haller Stirp. Helv. ii. 203; Benth. et Hook. Gen. Pl. iii. 1122.

A monotypic genus widely dispersed in tropical and temperate regions of both old and new world.

T. racemosus, Desf. Flor. Atl. ii. 386; Döll. in Mart. Flor. Bras. ii. pt. ii. t. 18.

T. brevicaulis, Boiss. Diagn. i. 13, 44.

Lappago racemosa, Willd. Sp. i. 484; Kunth Enum. i. 170, and Revis Gram. ii. t. 120.

Socotra. Common. B.C.S. nn. 568, 570.

DISTRIB. Of the genus.

10. IMPERATA.

Imperata, Cyr. Pl. Rar. Ic. ii. 26, t. 11; Benth. et Hook. Gen. Pl. iii. 1125.

A small genus of three or four species spread through the whole tropics.

I. arundinacea, Cyr. Pl. Rar. Ic. ii. 26, t. 11; Kunth Enum. i. 477; Reichb. Ic. Flor. Germ. i. t. 55.

Socotra. Occasional. B.C.S. n. 343.

DISTRIB. Round the world in the tropics.

11. ARTHRAXON.

Arthraxon, Beauv. Agrostog. 111, t. 11, f. 6; Benth. et Hook. Gen. Pl. iii. 1128.

A small old world genus chiefly of Indian distribution.

A. molle, Benth. et Hook. Gen. Pl. iii. 1128.

Batratherum molle, Nees in Edin. New Phil. Journ. xviii. 181.

Psilopogon Schimperi, Hochst. in herb. Schimp. Abyss. sect. i. 96; Ach. Rich. Tent. Flor. Abyss. ii. 447.

Socotra. Common. B.C.S. n. 474. Schweinf. n. 696.

DISTRIB. From the Atlantic Islands through tropical Africa and Mascarene Islands to India.

12. HETEROPOGON.

Heteropogon, Pers. Syn. ii. 533; Benth. et Hook. Gen. Pl. iii. 1133.

A genus of about two species universally met with in the tropics.

H. hirtus, Pers. Syn. ii. 533.

H. contortus, Beauv. ex Rœm. et Schult. Syst. ii. 836.
H. hirsutus, Beauv. Agrostogr. 134.
H. hispidissimus, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1219.
Andropogon contortus, Linn. Sp. 1480; Kunth Enum. i. 486; Ach. Rich. Flor. Abyss. ii. 455.

Socotra. Common on the hill slopes. B.C.S. nn. 220, 324. Schweinf. n. 481.

Distrib. Widely spread in the tropics of the globe.

13. ANDROPOGON.

Andropogon, Linn. Gen. n. 1145; Benth. et Hook. Gen. Pl. iii. 1133.

A considerable genus of species, often difficult to diagnose, spread throughout the warmer regions of the whole world, occasionally touching cooler districts. The three Socotran species have an old world distribution.

1. **A.** (Cymbopogon) **hirtus**, Linn. Sp. 1482; Kunth Enum. i. 492; Ach. Rich. Tent. Flor. Abyss. ii. 459.

A. pubescens, Visiani in Flora 1829, Suppl. 3; Kunth Enum. i. 492.
A. papillipes, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1055; Ach. Rich. Tent. Flor. Abyss. ii. 460.
A. fulvicomus, Hochst. *loc. cit.* nn. 935, 1118; Ach. Rich. *loc. cit.* 463.
A. fulvicomus, Hochst. var. *approximatus*, Hochst. *loc. cit.* nn. 928, 1114.
A. podtrichus, Hochst. *loc. cit.* n. 1056.

Nom. Vern. Kasāde (B.C.S.).

Socotra. Abundant. B.C.S. n. 386. Schweinf. n. 482.

Distrib. Widely spread in the tropics of the old world.

2. **A.** (Cymbopogon) **laniger**, Desf. Flor. Atl. ii. 379; Kunth Enum. i. 493.
Gymnanthelia lanigera, Anders. in Schweinf. Flor. Æthiop. 300.

Nom. Vern. Schahar (B.C.S.).

Socotra. On the hills near Galonsir and Tamarida. B.C.S. nn. 275, 379. Schweinf. n. 405.

Distrib. North Africa and the dry plains of south-west Asia to northern India.

The roots and old stocks of this plant are very strongly scented.

3. **A.** (Gymnandropogon) **pertusus**, Willd. Sp. iv. 922; Kunth Enum. i. 498.
A. punctatus, Roxb. Flor. Ind. i. 264.
A. insculptus, Hochst. in herb. Schimp. Abyss. sect. i. n. 80; Ach. Rich. Tent. Flor. Abyss. ii. 458.

Socotra. On the Haghier hills. B.C.S. n. 308. Schweinf. n. 695.
Distrib. Tropical Africa and Asia, also Australia.

14. CHRYSOPOGON.

Chrysopogon, Trin. Fundam. Agrostog. 187; Benth. et Hook. Gen. Pl. iii. 1135.

A small genus dispersed in the warmer regions of both the old and new world.

C. Gryllus, Trin. Fundam. Agrostog. 188, and in Mem. Acad. Petersb. ser. 6, ii. 317.

Andropogon Gryllus, Linn. Sp. 1480; Kunth Enum. i. 504; Sibth. Flor. Græc. t. 67.

Socotra. On the plains about Galonsir. B.C.S. nn. 562, 567.
Distrib. Tropics and warmer parts of temperate regions of the old world.

15. ANTHISTIRIA.

Anthistiria, Linn. f. Nov. Gram. Gen. in Amœn. Acad. x. app. 38, et Suppl. Pl. 13; Benth. et Hook. Gen. Pl. iii. 1136.

A genus of warmer regions in the old world. The species, which have been multiplied by authors, are reduced by Bentham and Hooker to about ten.

A. ciliata, Linn. f. Suppl. 113; Kunth Enum. i. 481.

A. australis, R. Br. Prod. 200; Hook. f. Flor. Tasm. ii. 107, t. 156.
A. cæspitosa, Anders. in Nov. Act. R. Soc. Ups. ii. 241.

Socotra. Common on the hills. B.C.S. n. 239. Schweinf. 581.
Distrib. Through tropical Africa and Asia, also Australia.

16. APLUDA.

Apluda, Linn. Gen. n. 1147, pro parte; Benth. et Hook. Gen. Pl. iii. 1137.

A ditypic genus, the variable species being dispersed in the old world tropics and Pacific Islands.

A. aristata, Linn. Sp. 1487; Kunth Enum. i. 516; Lamk. Ill. t. 841.

A. microstachya Nees ex Wight. Cat. 101, and in Nov. Act. Nat. Cur. xix. Suppl. 193.
A. communis, Nees *loc. cit.*

Socotra. Common. B.C.S. n. 229. Schweinf. n. 344.
Distrib. Tropical Africa and Asia.

17. ARISTIDA.

Aristida, Linn. Gen. n. 94; Benth. et Hook. Gen. Pl. iii. 1140.

A genus very widely dispersed over the tropical and some of the temperate regions of the old and new worlds. Both Socotran species are limited to the old world, one of them being confined to south-west Asia and the adjacent regions of Africa.

1. **A.** (Chætaria) **adscensionis**, Linn. Sp. 121; Kunth Enum. i. 190.

A. depressa, Retz. Obs. iv. 22; Kunth *loc. cit.*

A. cærulescens, Desf. Flor. Atl. i. 109, t. 21, f. 2; Kunth *loc. cit.*; Ach. Rich. Tent. Flor. Abyss. ii. 391.

A. mauritiana, Kunth Gram. i. 265, t. 44.

Socotra. Very common. B.C.S. n. 94. Schweinf. n. 694

Distrib. Tropics of the old world.

Our Socotran plant is the *cærulescens* form of this species, having almost glabrous glumes which are curiously spotted.

2. **A.** (Arthratherum) **murina**, Cav. Ic. v. 44. t. 469, f. 1; Kunth Enum. i. 192.

A. funiculata, Trin. et Rupr. in Act. Acad. Petrop. ser. 6, v. 159 (*funicularis*, Edgw. in Journ. Asiat. Soc. Beng. xxi. (1852), 59).

A. Kotschyi, Hochst. in herb. Kotsch. Nub. n. 31.

Socotra. Near Galonsir. B.C.S. n. 240.

Distrib. North-east tropical Africa and south-west Asia.

18. SPOROBOLUS.

Sporobolus, R. Br. Prod. 169; Benth. et Hook. Gen. Pl. iii. 1148.

A large genus widely spread over the temperate and warmer regions of the globe.

Sp. spicatus, Kunth Revis. Gram. i. 67, and Enum. i. 210; Ach. Rich. Tent. Flor. Abyss. ii. 394.

Agrostis spicata, Vahl; Delile Fl. Ægypt. 20, t. x.

Socotra. Not uncommon. B.C.S. n. 221.

Distrib. From the Atlantic islands and the dry regions of tropical Africa to south-west Asia.

19. CYNODON.

Cynodon, Rich. in Pers. Syn. i. 85; Benth. et Hook. Gen. Pl. iii. 1164.

A small genus, including three species endemic in Australia, and one widely spread as a weed of cultivation over the whole tropical globe.

C. (Fibichia) **dactylon**, Rich. in Pers. Syn. i. 85; Kunth Enum. i. 259; Ach. Rich. Tent. Flor. Abyss. ii. 405.

Socotra. Near Galonsir. B.C.S. n. 121.

Distrib. Cosmopolitan weed in warmer countries.

20. CHLORIS.

Chloris, Swartz Prod. 25; Flor. Ind. Occid. 189, t. 3; Benth. et Hook. Gen. Pl. iii. 1165.

A considerable genus widely spread in the warmer regions of the whole world.

C. barbata, Swartz Flor. Ind. Occid. i. 200; Kunth Enum. i. 264.

C. meccana, Hochst. et Steud. in herb. Schimp. Arab. n. 802.

Socotra. Common. B.C.S. n. 341.

Distrib. Common tropical weed.

21. MELANOCENCHRIS.

Melanocenchris, Nees in Proc. Linn. Soc. i. 94; Benth. et Hook. Gen. Pl. iii. 1169.

A genus of three nearly allied species found in tropical Africa, Arabia, and East India.

M. Royleana, Nees in Ann. Nat. Hist. vii. (1841), 221; Steud. Sp. Gram. i. 218.

M. Jacquemontii, Jaub. et Spach. Ill. Pl. Or. iv. t. 325.

M. plumosa, Jaub. et Spach. *loc. cit.*

Pennisetum plumosum, Hochst. et Steud. in herb. Schimp. Arab. n. 794.

Socotra. Very common. B.C.S. n. 135. Schweinf. n. 485.

Distrib. India, Scindh, Arabia, and north-east tropical Africa.

M. plumosa is merely a form of the Indian plant with fewer and larger spikelets. It occurs in Arabia and in north-east tropical Africa. The Socotran plant is the typical Indian form.

22. ELEUSINE.

Eleusine, Gärtn. Fruct. 1. 7, t. 1; Benth. et Hook. Gen. Pl. iii. 1172.

A genus of which many species have been described, but these are reduced by Bentham and Hooker to about seven. They are essentially plants of the tropical and subtropical regions of the old world, but some are widely spread in warmer America. Some are common weeds everywhere in tropical countries, and to this category belong two of the Socotran species, the third being an Asiatic, African, and Australian form.

1. E. ægyptia, Pers. Syn. i. 87.

Dactyloctenium ægyptiacum, Willd. Enum. 1029; Kunth Enum. i. 261; T. Anders. in Journ. Linn. Soc. v. (1860), Suppl. 41.

Socotra. In many places. B.C.S. nn. 42, 69.

Distrib. A common weed everywhere.

2. E. indica, Gärtn. Fruct. i. 8; Kunth Enum. i. 272; Trin. Spec. Gram. i. t. 71.

Socotra. Common and cultivated. B.C.S. nn. 266, 361. Schweinf. n. 574.

Distrib. Common in tropical and subtropical regions.

In Socotra this is cultivated under the name of Bombé; our n. 296 is an example of it. We have (n. 389) a dwarf form of the species.

3. E. verticillata, Roxb. Flor. Ind. i. 346.

Leptochloa (?) *racemosa* and *L. verticillata*, Kunth Enum. i. 272.

L. schimperiana, Hochst. in herb. Schimp. Abyss. ed. Hohenack. n. 2237.
Ærachne elusinoides, W. and A. in herb. Wight.

Socotra. On the Haghier hills. B.C.S. n. 378.

Distrib. Tropical Africa and Asia, also Australia.

23. PAPPOPHORUM.

Pappophorum, Schreb. Gen. Pl. 787; Benth. et Hook. Gen. Pl. iii. 1174.

A small genus widely spread in the warmer regions of the whole world.

1. P. (Enneapogon) **Aucheri**, Jaub. et Spach. Ill. Pl. Or. iv. t. 323.

Socotra. Near Galonsir. B.C.S. n. 110.

Distrib. Æthiopia, Persia, and Affghanistan.

Our specimens are as a rule much smaller than the Affghan ones.

2. P. **elegans**, Nees ex Wight Cat. 104. n. 1771; Steud. Spec. Gram. i. 199.

Socotra. Near Galonsir. B.C.S. n. 90.

Distrib. India.

24. ERAGROSTIS.

Eragrostis, Beauv. Agrostog. 70, t. 14, f. 11; Benth. et Hook. Gen. Pl. iii. 1186.

A considerable genus of warm and temperate regions of the whole world, a few species being cosmopolitan, and two such occur in Socotra; the other three Socotran species are old world forms of greater or less range.

1. E. **plumosa**, Link Hort. i. 192; Steud. Syn. Gram. 266.

E. lepida, Hochst. in herb. Schimp. Abyss. sect. ii. n. 1040.
Poa plumosa, Retz. Obs. iv. 20; Kunth Enum. i. 338.
P. lepida, Ach. Rich. Tent. Flor. Abyss. ii. 424.
P. tenella, Kunth Rev. Gram. t. 147 (excl. descr.).

Socotra. A common weed. B.C.S. nn. 573, 575. Schweinf. n. 487.

Distrib. Tropical Asia and Australia, more rarely reported from tropical Africa.

Both tall and dwarf forms of this species occur.

2. E. **orientalis**, Trin. in Bunge Enum. Pl. Chin.(1831) 71; Steud. Syn. Gram. t. 267.

E. Willdenovii, Nees in Steud. Nom. Bot., var. *nana*, Munro MS. in herb. Kew.

Socotra. Not uncommon. B.C.S. n. 253.

Distrib. Tropical Asia.

A species confounded with *E. pœoides*, Beauv. (Agrostog. 70, t. xiv. f. 11, *Poa Eragrostis*, Linn; Sibth. Flor. Græc. t. 73), which is, however, a large megastachyoid species occurring in Europe, Asia, and other localities, from which, however, the form of the spikelets distinguishes it. Probably many of the African forms referred under that species are really this one.

3. E. (Leptostachya) **pilosa**, Beauv. Agrostog. 71.

E. cylindrifolia, Hochst. in herb. Schimp. Abyss. ed Hohenack. n. 2297.
E. verticillata, Rœm. et Schult. Syst. ii. 575.
Poa pilosa, Linn. Sp. 100; Kunth Enum. i. 329; Ach. Rich. Tent. Flor. Abyss. ii. 426.
P. verticillata, Cav. Ic. i. 63, t. 93.

Socotra. Near Galonsir. B.C.S. n. 125.

Distrib. Warmer regions of the globe. Most common in the old world.

4. E. (Cataclastos) **ciliaris**, Link Hort. Berol. i. 192.

Poa ciliaris, Linn. Sp. 102; Jacq. Ic. t. 304; Kunth Enum. i. 337; Ach. Rich. Tent. Flor. Abyss. ii. 423.

Socotra. Common. B.C.S. n. 209. Schweinf. n. 306.

Distrib. Warmer regions of the globe.

5. E. (Megastachya) **cynosuroides**, Rœm. et Schult. Syst. ii. 577.

Poa cynosuroides, Retz Obs. iv. 20; Delile Fl. Ægypt. 22, t. 10, f. 3; Kunth Enum. i. 327.

Socotra. Near Tamarida. B.C.S. n. 257.

Distrib. From Egypt eastwards through south-west Asia to India.

25. ÆLUROPUS.

Æluropus, Trin. Fundam. Agrostog. 143; Benth. et Hook. Gen. Pl. iii. 1193.

A small genus the species of which have been much multiplied. It has a distribution from the Mediterranean region eastwards to eastern India.

Æ. **repens**, Parl. Flor. Ital. i. 462.

Dactylis repens, Desf. Flor. Atl. i. 79, t. 15.
Calotheca repens and *C. niliaca*, Spreng. Syst. i. 347 and 348.

Socotra. On the shore at Galonsir and Tamarida. B.C.S. n. 204. Schweinf. n. 340.

Distrib. Mediterranean region and through north-east Africa and Arabia to Scindh and north-west India.

26. LOLIUM.

Lolium, Linn. Gen. n. 95; Benth. et Hook. Gen. Pl. iii. 1202.

A small genus with species endemic in Europe, temperate Asia, and north Africa, but now introduced in all parts of the globe.

L. **temulentum**, Linn. Sp. 122; Kunth Enum. i. 437; Ach. Rich. Tent. Flor. Abyss. ii. 440; Reichb. Ic. Flor. Germ. t. 5.

Socotra. Near Adona. B.C.S. n. 260.

Distrib. All over the world as a weed introduced.

27. LEPTURUS.

Lepturus, R. Br. Prod. 207; Benth. et Hook. Gen. Pl. iii. 1204.

A small genus including, with our endemic Socotran one, seven species, five being European, north African, and temperate Asiatic forms, some reaching Australia, the sixth is a south Pacific and Australian species.

L. tenuis, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 97.

Cæspitosus breviter repens tenuis; foliis angustis linearibus glaucis longis piloso-puberulis; spicis compressis; gluma vacua solitaria plurinervi florente paleaque duplolongiore; stipite glumam minutam hyalinam gerente.

Perennis cæspitosus sobole repente brevi culmis pedalibus paucis adscendentibus. *Folia* plurima a basi culmorum patentia elongata, caulinia pauca glauca puberula ciliata 5-nervia in loco ligulæ villosa, vagina brevi prominenter nervosa. *Rhachis* elongata tenuis compressa striata puberula. *Spicæ* 2–3 poll. longæ multo compressæ plerumque curvatæ tenues, internodiis $\frac{1}{8}$ poll. longis. *Gluma* extima vacua $\frac{3}{10}$ poll. longa longe acuta prominenter 6–8-nervis basi incrassato-tumida margine paullo inflexa; gluma florens secunda extima dimidio brevior tenuis hyalina trinervis lanceolata acuta apice minute pilosa; palea subæquilonga et conformis 2-nervis. *Stipes* palea dimidio brevior glumæ floris imperfecti hyalinæ lanceolatæ subæquilonga.

Socotra. On the plains at the eastern end of the island. B.C.S. n. 572.

Distrib. Endemic.

A distinct species having many points of resemblance with *L. filiformis*, Trin. (Fundam. Agrostog. 123; Kunth Enum. i. 462), a Mediterranean, Atlantic Island, and northern Asiatic species, but the single long empty glume of our plant is diagnostic. Probably its nearest affinity is with the Australian and south Pacific *L. repens*, R. Br. (Prod. 207), but that is a much more robust plant, more widely creeping, more glaucous, and has shorter and broader leaves.

28. ISCHNURUS.

Ischnurus, Balf. fil. in Proc. Roy. Soc. Edin. xii. (1882), 98.

Spiculæ 1-floræ in spica simplici ad excavationes rhacheos compressæ solitariæ, alternæ, sessiles, rhachilla brevissima supra glumam inferiorem articulata ultra florem in stipitem brevem plerumque florem imperfectum gerentem producta, flore hermaphrodito. Gluma infima vacua, rhachi opposita, brevis, rigida, oblonga, truncata v. obtusa, basi incrassata tumida, 8-nervis, margine membranacea; florens æquilonga, membranacea, trinervis, apice obscure trifida ciliata; palea æquilonga, membranacea, 2-nervis. Stamina 3. Styli breves, distincti, stigmatibus plumosis. Caryopsis late ellipsoidea, compressa, glabra, gluma paleaque inclusa, libera.—Gramen perenne, nanum v. elatum, cæspitosum, multicaule, foliis glaucis pilosis. Spica terminalis, rigida, tenuis, recta, spiculis parvis dissitis in rhachi alte excavata quasi inclusis, gluma infima vacua semper adpressa.

A new genus of Hordeæ with a very distinctive facies. Its nearest affinity in the tribe is the Indian monotypic *Oropetium*, Trin. (Fundam. Agrostog. 98, t. 3; Benth. et Hook. Gen. Pl. iii. 1206), in which the spikelets are completely sunk

in hollows of the rhachis and there are two lower empty glumes, the lowest being towards the rhachis. These characters sufficiently separate it from our plant. Related on the one hand to that genus, *Ischnurus* has an alliance on the other hand with *Lepturus*, R. Br. (Prod. 207; Benth. et Hook. Gen. Pl. iii. 1204), a genus the distribution of which I have just referred to. But in it the flowers are not so deeply embedded in the rhachis, the relative size and form of the glumes is different, and the spikes are not so compact, and our plants do not well fit in with its generic character.

With several genera in the sub-tribe Rottboellieæ our genus has points of resemblance, but its spikes and glumes prevents it going into that set.

We have only one species of the genus.

I. pulchellus, Balf. fil. *loc. cit.* Tab. XCVIII, B.

Cæspitosus densus.

Culmi validi inferne depressi et baseis foliorum delapsorum dense vestiti superne in tenues rhaches elongati plerumque semi-pedales rarius sesquipedales. *Folia* angusta linearia plerumque brevia torulosa subtiliter pilosa sed in plantis majusculis sæpe $\frac{3}{4}$ ped. longa et conspicue pilosa omnia glauca; ligula oblonga obtusa parva. *Rhachis* sub spica striata compressa erecta. *Spica* 1 poll. longa spatha brevi ventricosa primum inclusa. *Gluma* extima $\frac{1}{10}$ poll. longa apice obscure brevissime ciliata 8-nervis, nervis per pares dispositis; gluma florens ovata basi concava subventricosa.

Socotra. Near Galonsir. B.C.S. nn. 109, 301.

Distrib. Endemic.

This is a very pretty tufted grass with, as a rule, a dwarf habit, covering the sand of the plains and sending up stiff stalks, each topped by a tail-like spike. Our n. 301 shows a form of it more luxuriant than usual and with much longer leaves, and the spike rhachis showing a tendency to branch at the base.

CRYPTOGAMÆ VASCULARES.

FILICINÆ.

MARSILEACEÆ.

MARSILEA.

Marsilea, Linn. Gen. n. 799; A. Braun in Monatsb. Akad. Wiss. Berol. (1863), 417.

A genus of about twenty species of creeping herbs found in all parts of the world.

M. coromandelina, Willd. Sp. v. 539; A. Braun *loc. cit.* p. 422; Kuhn in Ber. Deut. Bot. Ges. i. (1883), 240.

M. quadrifida, Burm. Flor. Ind. 237. c. t. 62, f. 3 (sub. *coromandelica*).

Socotra. In many of the streams about the middle of the island. B.C.S. n. 461. Schweinf. nn. 437, 536, 685.

DISTRIB. Shores of the Indian Peninsula and Senegambia.

A species which varies considerably both in size of fruit and size of leaf.

POLYPODIACEÆ.*

1. ADIANTUM.

Adiantum, Linn. Gen. n. 782; Hook. and Baker Syn. Fil. ed. 2 (1874), 113.

A genus including about 80–90 species of tropical and subtropical regions, having its headquarters in tropical America. Of the three Socotran species two are widely dispersed, but one is endemic.

1. A. Capillus-Veneris, Linn. Sp. 1558; Hook. and Baker Syn. Fil. ed. 2 (1874), 123; Hook. Brit. Ferns, t. 41; Kuhn in Ber. Deuts. Bot. Ges. i. (1883), 239.

* I have availed myself of Mr Baker's extensive knowledge of Ferns in determining the Socotran species, and to him I am indebted for the description of, and notes to the new species.

NOM. VERN. Youlaham.

Socotra. Not frequent. B.C.S. n. 415. Schweinf. nn. 772, 773.

DISTRIB. Widely spread in tropical and warm temperate regions.

2. A. æthiopicum, Linn. Sp. 1560; Hook. and Baker Syn. Fil. ed. 2 (1874), 123; Hook. Sp. Fil. ii. 37, t. 77 A.

A. thalictroides, Willd. mss.; Kze. in Linnæa x. 530.

Socotra. On the Haghier hills south of Tamarida. B.C.S. n. 436.

DISTRIB. Throughout the tropics of both hemispheres, especially in Abyssinia, at the Cape, and in Australia.

This is the form with large pinnules, the *A. crenatum,* Poir. Encyc. Suppl. i. 137.

3. A. Balfourii, Baker in Proc. Roy. Soc. Edin.; Kuhn in Ber. Deuts. Bot. Ges. i. (1883), 238. Tab. 99.

Caudice brevi reptante, paleis densis parvis linearibus brunneis, stipite nudo elongato; frondibus lanceolatis simpliciter pinnatis glabris haud caudatis, pinnis 6–10-jugis brevissime petiolatis orbiculatis, basi late deltoideis; soris linearibus inæqualibus secus pinnarum marginem totam præter basin productus.

Caudex leviter reptans epigæus, crassitie pennæ cygni, paleis firmis brunneis linearibus $\frac{1}{6}$ poll. longis dense vestitus. *Stipites* nudi erecti graciles castanei contigui 4–6 poll. longi. *Lamina* lanceolata glabra membranacea utrinque viridia 6–8 poll. longa, 1–$1\frac{1}{2}$ poll. lata, ad apicem haud caudatam sensim attenuata, rhachi gracili nuda castanea, pinnis 6–10-jugis brevissime petiolatis plerisque oppositis vel suboppositis orbiculatis $\frac{1}{4}$–1 poll. latis, basi late deltoideo vel in inferioribus truncato, margine sterilium denticulato, venis crebris gracillimis e basi flabellatim radiantibus. *Sori* secus marginem totam pinnarum præter basin dispositi lineares valde inæquales, involucro angusto glabro brunneo persistente.

Socotra. Abundant on the hills at the eastern and central parts of the island. B.C.S n. 198. Schweinf. nn. 544, 774. Kuhn (*loc. cit.*) gives also n. 302 for some of Schweinfurth's specimens. We do not have it from him under that number.

DISTRIB. Endemic.

This species has its nearest ally in *A. lunulatum,* Burm. Flor. Ind. 235. But from it in all forms it is readily distinguished by its orbicular and equally sided pinnules, which are all shortly stalked.

2. CHEILANTHES.

Cheilanthes, Swartz Syn. Fil. 126; Hook. and Baker Syn. Fil. ed. 2 (1874), 131.

A considerable tropical genus, of about 60–70 species, some of which extend into extra tropical regions.

Ch. (Aleuritopteris) farinosa, Kaulf. Enum. Fil. 212; Hook. and Baker, Syn. fil. ed. 2 (1874), 142; Bedd. Ferns South. Ind. t. 191; Bot. Mag. t. 4765.

Socotra. On the hills south-west of Galonsir. B.C.S. n. 329.

DISTRIB. Across tropical Africa, and through Arabia to India and the eastern Archipelago. Also in tropical America.

Kuhn (in Ber. Deut. Bot. Ges. i. (1883), 239) adds to his note upon the Socotran fern he names "*Pteridella involuta*, Mett. var. *tripinnatisecta*, Mett." (which we refer to as *Pellæa* (Platyloma) *viridis*, Baker), the remark, "Wahrscheinlich ist die in der Balfour 'schen Liste erwähnte *Cheilanthes* spec. mit unserer Art identisch." This has been a mere guess. Our plant is very different.

3. ONYCHIUM.

Onychium, Kaulf. Enum. Fil. 144; Hook. and Baker Syn. Fil. ed. 2 (1874), 143.

A small genus of tropical and subtropical species.

O. melanolepis, Kze. Suppl. Schkuhr. Farnk. ii. 9, t. 104, f. 2; Hook. and Baker Syn. fil. ed. 2 (1874), 143; Hook. Ic. Pl. t. 902.

Allosorus melanolepis, Dene. Pl. d. l'Arab. Heur. in Archiv. d. Mus. ii. 189.

Socotra. Forming large patches on stony ground on the hills south-west of Galonsir. B.C.S. n. 291.

DISTRIB. Abyssinia, Arabia, and Persia.

4. PELLÆA.

Pellæa, Link Fil. Sp. Berol. 59; Hook. and Baker Syn. Fil. ed. 2 (1874), 144.

A considerable genus occurring in the tropics of both hemispheres.

1. P. (Cheiloplecton) concolor, Baker in Mart. Flor. Bras. Fasc. xlix. 596.

P. geraniifolia, Fee Gen. Fil. 130; Hook. and Baker Syn. Fil. ed. 2 (1874), 146 (*geraniæfolia*); Hook. Ic. Pl. t. 915.

Pteris concolor, Langs. and Fisch. Ic. t. 21.

Doryopteris concolor, Kuhn in v. d. Decken Reisen iii. 3. 19, and in Ber. Deut. Bot. Ges. i. (1883) 239.

Socotra. On the higher parts of Haghier at an elevation over 3000 feet. Schweinfurth, n. 654.

DISTRIB. Generally distributed in the tropics.

2. P. (Platyloma) viridis, Baker in herb. Kew.

P. hastata, Link Fil. Sp. Berol. 60; Hook. and Baker Syn. Fil. ed. 2 (1874), 152; Hook. Fil. Exot. t. 50.

Pteridella involuta, Mett. var. *tripinnatisecta*, Mett. ex Kuhn in v. d. Decken Reisen iii. 3. 15, and in Ber. Deut. Bot. Ges. i. (1883), 239.

Socotra. At Kischen. Elevation over 1800 feet. Schweinf. n. 596.

DISTRIB. A species limited to Africa, and its adjacent tropical islands.

5. PTERIS.

Pteris, Linn. Gen. n. 780; Hook. and Baker Syn. Fil. ed. 2 (1874), 153.

A large cosmopolitan genus.

1. P. longifolia, Linn. Sp. 1531; Hook. and Baker, Syn. fil. ed. 2 (1874), 153; Bedd. Ferns South Ind. t. 33; Kuhn in Ber. Deut. Bot. Ges. i. (1883), 239.

Socotra. Very common. B.C.S. n. 156. Schweinf. nn. 545, 775.

Kuhn (*loc. cit.*) gives n. 589 as number of one of Schweinfurth's specimens. We do not have it from him under that number.

Distrib. Common tropical and warm temperate fern.

2. P. quadriaurita, Retz. Obs. vi. 38; Hook. and Baker, Syn. Fil. ed. 2 (1874), 158; Hook. Sp. Fil. ii. 179, t. 134, B; Bedd. Ferns South Ind. t. 31.

P. biaurita, Linn. var. *repandula*, Kuhn in v. d. Decken Reisen iii. 3. 20, and in Ber. Deut. Bot. Ges. i. (1883), 239 (= *P. repandula*, Link Fil. Sp. Berol. 56).

Socotra. Not uncommon on the Haghier range. B.C.S. n. 450. Schweinf. n. 655. Kuhn gives 665 as Schweinfurth's number. Our specimen from him is number 655.

Distrib. Common in tropical and warm temperate regions round the world.

6. CERATOPTERIS.

Ceratopteris, Brong. Bull. Soc. Philom. (1821), 184, c. ic.; Hook. and Baker Syn. Fil. ed. 2 (1874), 174.

An anomalous monotypic genus inhabiting still fresh waters in the tropics.

C. thalictroides, Brong. *loc. cit.*; Hook. and Baker, *loc. cit.*; Hook. Sp. Fil. ii. 235; Bedd. Ferns South Ind. t. 75; Kuhn in Ber. Deut. Bot. Ges. i. (1883), 240.

Socotra. In streams near Tamarida. B.C.S. n. 77. Katheng. Schweinf. n. 679.

Distrib. Of the genus.

7. ASPLENIUM.

Asplenium, Linn. Gen. n. 783; Hook. and Baker Syn. Fil. ed. 2 (1874), 190.

An extensive cosmopolitan genus having three representatives in Socotra; of which two are widely dispersed in the tropics, and the other is endemic.

1. A. Trichomanes, Linn. Sp. 1540; Hook. and Baker Syn. Fil. ed. 2 (1874), 196; Hook. Brit. Ferns t. 29.

Socotra. On the Haghier hills south of Tamarida. B.C.S. n. 444.

Distrib. All over the world.

The Socotran plant has pinnules somewhat more distant than is typical.

2. A. Schweinfurthii, Baker in Proc. Roy. Soc. Edin.; Kuhn in Ber. Deut. Bot. Ges. i. (1883), 239. Tab. 100.

Caudice erecto, paleis clathratis nigrescentibus acuminatis, stipitibus elongatis dense cæspitosis; frondibus oblongo-lanceolatis simpliciter pinnatis, pinnis 6–8-jugis lanceolatis serratis, basi inæqualibus subsessilibus, infimis reductis, venis laxis perspicuis; soris magnis oblongis confluentibus.

Caudex erectus paleis clathratis nigrescentibus acuminatis lanceolatis v. lanceolato-deltoideis dense vestitus. *Stipites* permulti dense cæspitosi 3–6 poll. longi paleis minutis consimilibus linearibus vel subulatis præditi. *Lamina* oblongo-lanceolata firmula semipedalis 2–2½ poll. lata utrinque sordide viridis; rhachi minute paleacea, pinnis 6–8-jugis lanceolatis, serratis sessilibus v. brevissime petiolatis, basi postice cuneato-truncatis, centralibus 1–1¾ poll. longis, ¼–⅓ poll. latis, infimis conspicue reductis, impari terminali sæpessime magno. *Venæ* laxæ perspicuæ erecto-patentes furcatæ. *Sori* oblongi magni demum confluentes pinnarum totam faciem inferiorum occupantes, involucro membranaceo fugaci.

NOM. VERN. Tajayia.

Socotra. On the Haghier hills south from Tamarida. B.C.S. n. 490. Schweinf. n. 663.

DISTRIB. Endemic.

A close ally of *A. marinum*, Linn. (Sp. 1540), from which it differs by its peculiar paleæ extending to the style and rhachis, its darker green colour and firmer texture, its pinnæ not more than half as numerous and more distant from one another, its much fewer veins, and very large oblong confluent sori.

3. A. præmorsum, Swartz Prodr. Fil. Ind. Occ. (1788), 130.

A. furcatum, Thunb. Prod. Cap. (1794) 172; Hook. and Baker Syn. Fil. ed. 2 (1874), 214; Bedd. Ferns South. Ind. t. 144.

Socotra. On the Haghier hills above Tamarida. B.C.S. n. 443.

DISTRIB. A widely spread tropical species.

8. ACTINOPTERIS.

Actinopteris, Link Fil. Sp. Berol. 73; Hook. and Baker Syn. Fil. ed. 2 (1874), 246.

A genus including a single species of considerable distribution in Africa, the Mascarene Islands, and eastern Asia.

A. dichotoma, Bedd. Ferns South. Ind. 43, t. 124.

A. dichotoma, Mett. var. *australis*, ex Kuhn in Ber. Deut. Bot. Ges. i. (1883), 239.

A. radiata, Link *loc. cit.*; Hook. and Baker *loc. cit.*; Hook. Ic. Pl. tt. 975, 976.

A. radiata, Link var. *australis*, Hook. Sp. Fil. iii. 275.

Socotra. Common. B.C.S. n. 144. Schweinf. nn. 312, 776.

DISTRIB. Of the genus.

9. NEPHRODIUM.

Nephrodium, Rich. in Michx. Fl. Bor. Amer. ii. 266; Hook. and Baker Syn. Fil. ed. 2 (1874), 259.

A large cosmopolitan genus.

1. N. (Lastrea) crenatum, Baker Flor. Maur. 497.

N. odoratum, Hook. and Baker Syn. Fil. ed. 2 (1874), 280.
N. eriocarpum, Dcne. Pl. de l'Arab. Heur. in Archiv. Mus. ii. 185.
Lastrea eriocarpa, Presl. Tent. Pterid. 77, t. 2, f. 9; Bedd. Ferns South Ind. t. 95.
Hypodematium crenatum, Kuhn in Ber. Deut. Bot. Ges. i. (1883), 240.

Socotra. On the Haghier hills above Tamarida. B.C.S. n. 447.

Distrib. Cape de Verde Islands, Africa (Abyssinia and the Cape), and warmer regions of the old world generally.

2. N. molle, Desv. Mem. Soc. Linn. vi. 258; Hook. and Baker Syn. Fil. ed. 2 (1874), 293; Bedd. Ferns South Ind. t. 84.

Aspidium molle, Swartz Syn. 49, var. *violascens*, Kuhn in Ber. Deut. Bot. Ges. i. (1883), 240 (=*A. violascens*, Link Fil. Sp. Berol. 100).

Nom. Vern. Sibrha (B.C.S.).

Socotra. Not uncommon on the hills. B.C.S. n. 388. Schweinf. n. 588.

Distrib. Round the world in warmer regions.

Identical with *Polypodium parasiticum*, Linn. (Sp. 1551), which name by rules of nomenclature followed by vascular cryptogamists should be adopted. C. B. Clarke (in Trans. Linn. Soc. ser. 2, i. (1880), 538) takes it up, but, as is pointed out in Synopsis Filicum, "the name *molle* is so thoroughly established for the species that it seems a pity to drop it."

10. NEPHROLEPIS.

Nephrolepis, Schott Gen. Fil. t. 4; Hook. and Baker Syn. Fil. ed. 2 (1884), 300.

A small genus dispersed round the world in the tropics and subtropics.

N. cordifolia, Presl. Tent. Pterid. 79; Hook. and Baker *loc. cit.*

N. tuberosa, Presl. *loc. cit.*; Bedd. Ferns South Ind. t. 92.

Socotra. On the Haghier range near Adona. B.C.S. n. 493.

Distrib. The tropical regions of both old and new worlds.

11. GYMNOGRAMME.

Gymnogramme, Desv. in Berl. Mag. v. 304; Hook. and Baker Syn. Fil. ed. 2 (1874), 376.

A considerable genus of mainly tropical forms, which have as a rule a very limited distribution.

G. cordata, Schlecht Adumbr. 16; Hook. and Baker *loc. cit.*; Hook. and Grev. Ic. Fil. t. 156.

Ceterach cordatum, Kuhn in Ber. Deut. Bot. Ges. i. (1883), 239 (=*C. crenatum*, Kaulf. Enum. Fil. 85).

Socotra. Above Kischen. Schweinf. n. 577.

Distrib. A South African species, spreading to Angola and Bourbon.

MUSCINEÆ.*

By WILLIAM MITTEN, A.L.S.

The Socotran Mosses and Liverworts, although but few in number, present some species which in point of affinity approach more nearly to the Indian Flora than, so far as is yet known, to that of Africa. Thus we have a species here supposed, in the absence of complete specimens, to belong to the small genus *Symblepharis*, which is represented in India and Java by two species only, two others being known from Mexico, and two from the Andes of New Granada and Quito, and no species are yet known to extend into the more temperate regions of either the northern or southern hemispheres. The *Hyophila* belongs to a group comprising species all very similar, but differing in minute particulars, and they are found only in the more tropical regions. The *Schlotheimia* is one of the most northern species; one and that very similar, is found in India; and the genus only attains its greatest development of species in south Brazil and southern tropical Africa, including the islands on the eastern coast, very few species reaching in America so far north as Mexico, and only one has yet been discovered in the southern United States.

MUSCI.

1. CAMPYLOPUS.

Campylopus, Brid. Br. Univ. i. 468, t. 4.

A genus often regarded as a section of *Dicranum*, containing a number of species spread over the whole world; some species, such as the one found in Socotra, have a very wide distribution.

C. introflexus, Brid. Br. Univ. i. 472, and Mant. Musc. 72.

Dicranum introflexum, Hedw. Sp. Musc. 147, t. 29, ff. 1–7; C. Müll. Synops. Musc. i. 405. *D. aureo-nitens*, C. Müll. *loc. cit.* 406.

Socotra. Common on the Haghier hills. B.C.S. nn. 1434, 1448. All barren stems.

Distrib. North of the equator in Madeira; abundant in Australasia, and in most islands of the southern hemisphere.

* I have received from Schweinfurth no specimens of Muscineæ collected by his expedition, nor have I seen any account of them.—B.B.

2. SYMBLEPHARIS.

Symblepharis, Montagn. in Ann. Sc. Nat. sér. 2, viii. (1837), 252; C. Müll. Synops. Musc. i. 460.

A small genus of some half-dozen species, two of them occurring in India, the Comoro Islands, and Java; two are known from Mexico, and two are brought from the Andes of New Granada and Quito. No species is yet known to extend into more temperate regions of either northern or southern hemisphere.

S. socotrana, Mitt.

Dioica, laxe cæspitosa, caulibus erectis simplicibus divisisve; foliis a basi subquadrata superne latiora caulem amplexante cellulis elongatis pellucidis areolata subulatis patentibus, siccis hamato-incurvatis canaliculatis, apice cymbiformibus subcucullatis integerrimis, nervo crassiusculo percursis, cellulis minutis rotundatis obscuris haud opacis, perichaetialibus conformibus parum longioribus; thecis in pedunculo mediocri erectis ovalibus calyptris dimidiatis.

Caulis centimetrum vix excedens simplex vel inferne divisus. Folia 2 mm. fusco-viridia firma. Pedunculus 1 cm. pallidus. Theca vetusta evacua chartacea pallide fusca.

Socotra. On the highest points of Haghier. B.C.S. nn. 1422, 1447.

Distrib. Endemic.

This species appears to grow in extensive loosely coherent patches, and resembles in miniature the Indian and Javan *S. Reinwardti*, Mitt. (*Gyrophyllum Reinwardti*, Dozy et Molk Musc. Frond. Archip. Ind. t. xlv); but it differs from most of the few known species of the genus in the entire margin of the apex of the leaf and in the more oval form of the capsule, all the examples of which are very old; a calyptra washed out from among the stems is of a brownish colour, and split half-way up on one side. No vestiges remain of the peristome.

3. WEISIA.

Weisia, Hedw. Fundam. Musc. ii. 90; C. Müll. Synops. Musc. i. 648.

A large genus of considerable dispersion over the globe, many species having a very limited distribution. On Socotra there are two, both endemic.

1. W. (Hymenostylium) socotrana, Mitt.

Dioica, humilis, caulis simplex divisusve; folia patentia subrecurva linealia obtusa marginibus incurvis canaliculata integerrima, nervo crassiusculo in mucronulo brevissimo excurrente cellulis minutis rotundatis densis distinctis basalibus paucis elongatis pellucidis, perichaetialia angustiora sublanceolata; theca in pedunculo subflexuoso erecta ovata leptoderma gymnostoma exanulata operculo convexo acuminato.

Socotra. Near Galonsir and Tamarida and elsewhere common. B.C.S. nn. 1292, 1299 *pro parte*, 1370, 1382, 1413, 1419.

Distrib. Endemic.

A small moss, which at first sight might easily be passed over as a *Weisia* allied to *W. controversa* (Hedw. Sp. Musc. 67, and Musc. Frond. iii. 12, t. 5, B); in some of the specimens the stem is very short, in others which are taller it does not exceed half an inch in height; the resemblance and form of the leaves with their thickened nerve is much more with *W. rupestris*, Hedw. (Sp. Musc. 72, t. 14, ff. 6–12 = *Gymnostomum rupestre*, Swægr. Sp. Musc. Suppl. i. 1, 31, t. 11). It is a little more robust than the species collected in Abyssinia by Schimper, and distributed as *Gymnostomum xanthocarpum*, var. *gracilescens caps. minore*, Hook. (in herb. Schimp. Abyss. sect. ii. n. 480).

2. **W.** (Hyophila) **punctulata**, Mitt.

Humilis; folia patula spathulata acuta planiuscula nervo in mucronulo brevissimo excurrente margine apicem versus minute serrulata cellulis minutissimis indistinctis quasi minutissime punctatis haud opacis basalibus paucis quadratis pellucidis areolatis.

Caulis 02–03. Folia viridia sicca involuta.

Socotra. On Haghier. B.C.S. 1451.

Distrib. Endemic.

Very nearly allied to the Indian *W.* (*Hyophila*) *involuta*, Hook. (Musc. Exot. t. 154, *Gymnostomum*), but with leaves less rigid and more minutely serrulate: *W.* (*Hyophila*) *Potieri*, Besch. from Nossi Comba, Nossi Bé, and Reunion, appears from the description to be a similar species, but the leaves are said to be opaque and the basal cells hexagonal.

4. TORTULA.

Tortula, Hedw. Fundam. Musc. ii. 92.

A vast genus of all regions of the globe.

T. cæspitosa, Schwægr. Sp. Musc. Suppl. i. 1. 120, t. 31.

Tortula Northiana, Grev. in Trans. Linn. Soc. xv. (1827), 42, t. 3, f. 4.
Barbula Northiana, C. Müll. Synops. Musc. i. 602.

Socotra. On Haghier, at considerable elevation. B.C.S. 1454.

Distrib. Mediterranean Europe, West Indies, and South America; it appears also in south Africa, but has not yet been identified amongst Indian mosses.

A few barren stems appear to be this species.

5. ANICTANGIUM.

Anictangium, Hedw. Sp. Musc. 1, 40.

The species of this genus all intimately resemble each other; they are found in all temperate regions, and are especially inhabitants of mountain rocks.

A. Mariei, Besch. in Rev. Bryol. 1880, 18.

Socotra. On the Sicante peak of Haghier, at an elevation over 3000 feet. B.C.S. n. 1389.

Distrib. Nossi Bé.

The specimens, all barren, are bright green above, and agree very nearly with the description given by M. Bescherelle of this moss from Nossi Bé, from whence he had the male plant only.

6. SCHLOTHEIMIA.

Schlotheimia, Brid. Sp. Musc. ii. 16, Mant. Musc. 114, t. 2, f. 10, and Br. Univ. 1, 320; C. Müll. Synop. Musc. i. 751.

The distribution of this very natural genus so far as yet known is well marked, the greater number of species occurring in regions south of the equator, chiefly in America and Africa, on both continents too, so far as known, on the eastern side. In America they abound in Brazil, but become scarce in the more northern portions of the continent; very few are found in the West Indian Islands, and only one in the United States, nor are there more on the western coasts. In Africa no species is recorded from Abyssinia, but they are numerous in Mauritius. Elsewhere the genus has but one species recorded from India, one from Borneo and Java, and one from Austral regions. In all the species the foliage, which is probably green when young, so soon becomes of a rusty brown colour that many show no trace of green, all being of a uniform rusty or chestnut brown. In the small group of species found in in Brazil the fruit stalk is so reduced in length that the appearance presented is precisely similar to that of the shortly pedunculated *Orthotricha*, so abundant in north temperate Europe and America.

S. Balfourii, Mitt.

Cæspites late expansi caulibus arcte repentibus ramosissimis foliis ovali-lanceolatis acuminatis cellulis omnibus rotundatis apicalibus paucis elongatis; rami erecti abbreviati condensati foliis marjoribus densissime insertis humidis patentibus apicibus paululum recurvis siccis arcte appressis parum contortis ovali-ligulatis obtusis apiculo minuto, sulcis plus minus rugulosis, nervo infra apicem desinente, cellulis superioribus rotundis inferioribus oblongis angustis; folia perichaetialia a caulinis vix diversa; theca in pedunculo brevi erecta cylindracea laevis, operculo conico acuminato, peristomio dentibus elongatis linea media conspicua siccis rovolutis, processibus internis erectis angustis brevioribus, calyptra capsulam totam obtegens apice subscabra basi laciniis ad apices foliorum perichaetialium decedentibus.

Socotra. A common moss on the higher parts of Haghier. B.C.S. nn. 1426, 1445.

Distrib. Endemic.

The specimens of this species show it to grow in very wide spreading patches, with densely placed upright branches which do not rise to the height of

half an inch. In colour, all the specimens are of a dark brown. Besides the form gathered in Socotra, there is another in Kew Herbarium from the "Shores of the Red Sea,"* which was named *S. rugifolia* by Mr Wilson, at a time when the species of the genus were supposed to be much fewer in number than is now known to be the case.

S. Balfourii belongs to the same group of species as the African *S. ventrosa*, C. Müll. (Synops. Musc. i. 756), and *S. ferruginea*, Brid. (Br. Univ. i. 743); but it more nearly resembles the Indian *S. Grevilleana*, Mitt. (Linn. Soc. Jour. i.) All these have the perichaetial leaves not obviously different in form or length from those of the branches.

7. PHILONOTIS.

Philonotis, Brid. Br. Musc. ii. 15, t. 6.

A genus frequently considered a section of *Bartramia*, widely spread in tropical and temperate regions.

P. pungens, Mitt.

Bartramia (*Philonotis*) *pungens*, Mitt. in Trans. Roy. Soc. 168 (extra vol.), 390, t. 37, A.

Socotra. On the slope of Haghier behind Tamarida. B.C.S. nn. 1419 *pro parte*, 1427.

Distrib. Rodriguez.

Small barren stems which seem to be identical with this species.

8. BRACHYMENIUM.

Brachymenium, Hook. in Swægr. Sp. Musc. Suppl. ii. 1, 131, 135.

A considerable genus of tropical regions, now commonly included in *Bryum*.

Brachymenium sp.

A few barren stems growing on a small branch with *Lejeunia* and *Frullania* (n. 1440), are just sufficient to indicate the presence of a species near to the Indian *B. nipalense*, Hook. (in Swægr. Sp. Musc. Suppl. ii. 1, 131, t. 135).

9. BRYUM.

Bryum, Linn. Gen. n. 1194.

A vast cosmopolitan genus.

? B. dichotomum, Hedw. Sp. Musc. 183, t. 48, ff. 8-12; C. Müll. Synops. Musc. i. 304.

A few barren stems of a species near to this grow with *Philonotis pungens*, Mitt.

* [It is possible this plant so marked may have been sent by Nimmo, and is therefore Socotran, but there is no means of determining this.—B.B.]

10. FABRONIA.

Fabronia, Raddi Atti dell Acad. Scienz. di Siena, ix. 230, ex C. Müll. Synops. Musc. ii. 31.

F. socotrana, Mitt.

Monoica; folia humida patentia imbricata ovalia ovatave acuminata cellula terminali elongata angusta margine denticulis paucis brevibus subintegerrimave nervo medio evanido cellulis oblongis versus angulos pluribus quadratis areolata, perichaetialia longiora conformia.

Socotra. On the highest peaks of Haghier near Adona. B.C.S. n. 1425.

Distrib. Endemic.

The specimens, all without fruit, seem to come nearest to the Abyssinan *F. schimperiana;* but are a little more robust, with the areolation of the leaves more lax, and the serrulation of the margin less evident.

HEPATICÆ.

1. LEJEUNIA.

Lejeunia, Libert. in Ann. Gen. Sc. Phys. 372, t. 5; Syn. Hep. 308.

A large cosmopolitan genus, chiefly developed in warmer and tropical regions.

L. serpyllifolia, Libert. Ann. Gen. Sc. Phys. vi. 374, t. 96, f. 2; Gotts. Lindb. et Nees, Syn. Hep. 374.

Socotra. B.C.S. 1440 *pro parte.*

Distrib. Cosmopolitan.

A few stems creeping on a small branch appear to belong to this species.

2. FRULLANIA.

Frullania, Raddi Jung. Etr. in Mem. Soc. Ital. Mod. xviii. 20, t. 2; Gotts. Lindb. et Nees, Syn. Hep. 408.

Another cosmopolitan genus, with its greatest development in the tropics.

1. F. socotrana, Mitt.

Monoica, exilis repens pinnatim ramosa ramulis simplicibus furcatisve; folia imbricata divergentia oblato-orbiculata apice incurva lobulo subgloboso compresso, cellulis parvis rotundis basi ad insertionem pluribus majoribus coloratis areolata, amphigastria parva caulem vix latiora; folia involucralia majora lobulo late lanceolato amphigastrioque ovato bidentato integerrimo; perianthio brevi compresso dorso biventre quadriangulato igitur cum plicis lateralibus octo-plicato, plicis omnibus sinuoso-undulatis; spicæ masculæ breves rotundatæ.

Socotra. B.C.S. On bark, nn. 1464, 1465.

Distrib. Endemic.

A small species creeping closely on bark, and generally resembling the South African *F. trinervis* in its mode of growth and in its leaves, but differing in the very much undulated angles of the perianth, which although itself quite smooth at first sight, looks rough like that of *F. dilatata*.

2. F. squarrosa, Nees ab Esenb. Syn. Hep. 416.

Socotra. B.C.S. n. 1440 *pro parte.*

DISTRIB. Some small stems on the twig with *Lejeunia serpyllifolia* Libert. appear to belong to this species.

3. OTIONA.

Otiona, Corda, in Opiz. Beitr. 2, Naturges. 648.
Plagiochlesma, Lehm. Nov. Stirp. Pug. iv. 13; Gotts. Lindb. et Nees, Syn. Hep. 511.

A small tropical genus with representatives in Africa, Asia, and America.

O. Aitonia, Forsk. Char. Gen. 147.

Socotra. B.C.S. Common on the rocks, n. 1417.

DISTRIB. Widely-spread over the warmer regions of the globe.

Without fructification, but agreeing with the usual states of this species recorded from Abyssinia.

4. FIMBRIARIA.

Fimbriaria, Nees ab Esenb. Hor. Phys. Berol. 44, and Syn. Hep. 555.

A small genus of most parts of the world; rarer in Africa.

F. pusilla, Mitt.

Fronde angusta lineari humida superne planiuscula viridi poris elevatis punctata margine nigro elevato, sicca marginibus inflexis conniventibus, inferne convexa nigro-purpurea, squamis concoloribus a basi lato subdentato-subulatis apicibus in junioribus ultra marginem frondis elevatis; pedunculo crasso striato fusco, basi pauci-piloso ad insertionem receptaculi vesiculoso-papulosi fusco-barbato; perianthiis divergentibus 9-fidis.

Frons 2 m. lata, radicellis hyalinis. Pedunculus 1 c. altus firmus. Perianthium 2 m. longum, laciniis hyalinis purpureo-tinctis basi combinatis apice cohaerentibus.

Socotra. Common on the rocks in many places. B.C.S. n. 1327.

DISTRIB. Endemic.

A small species related to the Indian *F. Wallichiana, F. sanguinea,* and *F. viridis,* L. et L., but in all its parts of firmer substance, and differing in many particulars from *F. abyssinica,* Gotts.

CHARACEÆ.

By Dr O. NORDSTEDT and ARTHUR BENNETT, F.L.S.

CHARA.

Chara, Linn. Gen. n. 801.

A genus almost universally distributed.

C. socotrensis, Nordst. in Ber. Deutsch. Bot. Ges. i. (1883), 241.

C. haplostephana (ad C. diplostephanas accedens) bistipulata ecorticata monoica.

Folia verticelli 10–11, ad genicula constricta, articulis circ. 5, elongatis 4, ultimo brevi, mucroniformi, infimis tantum (interdum binis, sæpe singulis) foliola et fructificationem gerentibus. Foliola unilateralia, quaterna, acicularia, anteriora paullo longiora quam lateralia sporangium non superantia, sæpe multo breviora. Stipulæ parvæ, ovatæ acuminatæ, foliis adpressæ, interdum tantum in unam seriem ordinatæ, sed sæpe in binas aculeis in serie inferiore minoribus et quoque vulgo sursum directis. Sporangium 11–12-gyratum (c. 0·85 mm. longum) coronula brevi obtusa (c. 0·2 mm. lata et 0·1 mm. alta), nucleo atro 10-gyrato (c. 0·52 mm. longo et 0·32 mm. lato).

Socotra. B.C.S. nn. 747, 749, 750 *pro parte*. Near Tamarida, Schweinf. n. 436; and near Katheng, Schweinf. n. 690.

Distrib. Endemic.

A species varying somewhat in the amount of incrustation, and the relative size of its parts.

Nordstedt (*loc. cit.*) says of it—"The systematic position of this species is somewhat doubtful." Of the species without a cortex there have been hitherto known only five, and these all haplostephanous unistipulate. Of them *C. australis*, R. Br., and *C. Wallichii*, A. Br., are diœcious; *C. corallina*, Klein, and *C. succincta*, A. Br., are monœcious, with fructification at the base of the whorls; and *C. coronata* (Ziz.) A. Br., is monœcious, with leaflets on the sterile segments. In *C. socotrensis*, the upper sterile part of the leaf consists usually of only primary segment cells without leaflets. The stipular cycle varies. Often one finds two stipules for each leaf, under which may be seen a small slightly projecting cell as is the case in other species, *e.g.*, in *C. coronata*. But very frequently this cell develops into a short usually upwardly directed bristle or rounded knob, whereby the stipular cycle is doubled. One may therefore

refer this species equally to the section Haplostephanæ and to Diplostephanæ. In Diplostephanæ the stipules for each leaf appear in double pairs, only seldom does it happen that one cell of the lower series hardens in its young condition, and fails to divide into two cells, each of which forms a bristle. The undermost cycle is always, so far as I have seen, directed downwards on the stem in Diplostephanæ, and for that reason I am inclined to place this species in Haplostephanæ rather than in Diplostephanæ. It is interesting to find this form, which connects two hitherto well-defined sections of the genus.

2. **C. gymnopitys**, A. Br. in Plant Müll. in Linnæa xxv. 708.

Socotra. B.C.S. nn. 748, 750 *pro parte.*
Distrib. India, New Zealand, Australia.

Quite rare in India.

3. **C. gymnopus**, A. Br. Schweiz. Char. 1849, p. 13 (char. emend. in Enum. Frag. Char. 1882).

var. **angolensis**, A. Br. Char. Afr.

Socotra. B.C.S. nn. 746, 750 *pro parte.*

Distrib. Of the species,—Asia, Africa, North and South America, Australia, New Caledonia. Of the variety,—Africa.

One of the many varieties of this species.

THALLOPHYTA.

FUNGI.

BASIDIOMYCETES

By Dr M. C. COOKE.

GASTEROMYCETES.

1. BATARREA.

Batarrea, Pers. Syn. Fung. 129.

A genus of only three or four species, all of them rare, found only in temperate regions.

B. Stevenii, Fries Syst. Myc. iii. 7.

Socotra. Only two specimens found near Galonsir. B.C.S. nn. 1300, 1345.
Distrib. Egypt, South Africa, Volga.

2. PODAXON.

Podaxon, Fries Syst. Orb. Veg. i. 139, and Syst. Myc. iii. 62.
Podaxis, Desv. Journ. Bot. 1809.

A small genus confined to tropical and subtropical countries.

P. pistillare, Fries Syst. Myc. iii. 63.

Socotra. Only one specimen gathered on Galonsir plain. B.C.S.
Distrib. Cape de Verde Islands, Niger, North-West India, Australia.

HYMENOMYCETES.

AGARICINI.

1. AGARICUS.

Agaricus, Tournef. (1700), Inst. p. 562; Fries Hym. Eur. 17.

A very large genus, distributed over the world, but chiefly in temperate regions.

A. (Pleurotus) applicatus, Batsch. Syn. f. 125; Fries Hym. Eur. 180.

Socotra. On bark. B.C.S. n. 1415.

DISTRIB. Europe, Australia, Tasmania, North America, and West Indies.

2. LENTINUS.

Lentinus, Fries Pl. Homon. (1825) 77.

A large genus, chiefly tropical or subtropical, a few species in temperate regions.

L. cochleatus, Fries Hym. Eur. 484.

Socotra. On trunks near Tamarida. B.C.S. n. 1353.

DISTRIB. Europe, United States.

POLYPOREI.

1. POLYPORUS.

Polyporus, Micheli Nov. Gen. 118; Fries Hym. Eur. 522; Cke. in Trans. Bot. Soc. Edin. xiii. 131.

A very large genus of about a thousand species, scattered over the whole world. Most abundant in the tropics.

P. igniarius, Fries Hym. Eur. 559.

Socotra. Near Galonsir. B.C.S. n. 1387.

DISTRIB. Europe, Siberia, India, Ceylon, Java, Philippines, Australia, Tasmania, New Zealand, South Africa, Brazil, United States, British North America, Admiralty Island.

2. TRAMETES.

Trametes, Fries Epicr. (1838), 488, and Summa Veg. Scandin. ii. 322, and Hym. Eur. 581.

A subtropical genus of about 150 species.

1. T. socotrana, Cke. in Proc. Roy. Soc. Edin. xi. (1882), 456.

Pileo sessili semiorbiculari, tenui, coriaceo, zonato-sulcato, velutino, albo; contextu concolore, poris magnis dentatis, demum confluentibus, umbrinis.

Socotra. Rare. On logs upon the slopes of Haghier south from Tamarida.

DISTRIB. Endemic. B.C.S. nn. 1342, 1383.

Allied to *T. colliculosa*, B., from which it differs in the decidedly velvety white pileus, white substance and umber pores.

2. T. rigida, Berk. and Mont. in Ann. Sc. Nat. 1849, 240.
var. **glabra,** Cke.

Socotra. On wood near Galonsir. B.C.S. n. 1411.

DISTRIB. Cuba, Brazil, St Domingo, United States, Australia.

HYDNEI.

KNEIFFIA.

Kneiffia, Fries Epicr. 529, and Hym. Eur. 628.

A small genus in temperate and subtropical regions.

K. setigera, Fries Hym. Eur. 628.

Socotra. On naked wood. B.C.S. n. 1318.

DISTRIB. Europe, North America, Ceylon.

AURICULARINI.

STEREUM.

Stereum, Pers. Obs. Myc. i. 35; Fries Epicr. 345.

A large genus pretty equally distributed over the world.

1. S. versiforme, B. and Curt. North American Fungi, n. 242.

Socotra. On rotten logs near Galonsir. B.C.S. n. 1341.

DISTRIB. United States.

2. S. retirugum, Cke. in Proc. Roy. Soc. Edin. xi. (1882), 456.

Coriaceo-membranaceum, murinum; pileo effuso, e cupulari explanato, confluente, marginato, ambitu pallide fimbriato; hymenio subvelutino, reticulato-venoso, murinaceo.

Socotra. On wood near Galonsir. B.C.S. n. 1341 bis. Also a smaller form. B.C.S. n. 1310.

DISTRIB. Endemic.

The pileus is one inch or more long, and the pale margin is alone free. The hymenium is not setulose.

CORTICIUM.

Corticium, Pers. Obs. Myc. i. 37; Fries Epicr. 556.

A genus chiefly found in temperate regions.

C. arachnoideum, B. and Br., Out. 273; Fries Hym. Eur. 649.

Socotra. On rotten wood; Galonsir plain. B.C.S. n. 1340.

DISTRIB. Europe, Australia, Tasmania, Venezuela, United States, South India.

TREMELLINI.

1. HIRNEOLA.

Hirneola, Fries Fung. Natal. 24.

A small genus, common in Australasia and its islands. One European species is found also in the southern hemisphere.

H. polytricha, Montg. Syll. 181.

Socotra. Common on logs and stumps. B.C.S. n. 1343.

DISTRIB. India, Ceylon, Madagascar, Mauritius, Cuba, Mexico, Bahia, Guiana, New Zealand, Australia, islands of South Seas.

2. DACRYMYCES.

Dacrymyces, Nees Syst. 89; Tulasne in Ann. Sc. Nat. sér. 3 (1853), tt. 11, 12.

A small genus of temperate regions.

D. stellatus, Nees Syst. 89, f. 90.

Socotra. On rotten wood; Galonsir plain. B.C.S. n. 1340 bis.

DISTRIB. Europe, United States.

UREDINEÆ.

BY DR M. C. COOKE.

UROMYCES.

Uromyces, Link Berl. Mag. vii. (1826), 28; Tulasne in Ann. Sc. Nat. sér. 4, ii. (1854), 185.

A rather large genus, parasitic on living plants, chiefly in temperate regions.

U. Commelinæ, Cke.

Soris compactis, convexis, atrofuscis, epidermide cinctis; sporis obovatis, longe stipitatis, fuscis lævibus; episporio ad apicem incrassato (·03 × ·018 mm.); pedicellis tenuibus, hyalinis flexuosis, diu persistentibus.

Socotra. On the leaves of species of *Commelina*; abundant. B.C.S.

DISTRIB. Endemic.

ASCOMYCETES.

LICHENES.

By Dr JEAN MÜLLER of GENEVA.

The lichen-flora of Socotra, so far as is known at the present time, contains 130 species with several varieties, belonging to 47 genera and 14 tribes. Of the species more than one half (69) or 53 per cent. are new to science, a fourth are exclusively species of the warmer regions of the globe, whilst the remaining fourth includes species found also in Europe. The tropical and subtropical species thus constitute three-fourths of the whole lichen-flora.

The genera of crustaceous lichens are best represented. *Opegrapha*, *Buellia*, *Pertusaria*, and *Parmelia* exhibit the greatest number of species, the first three being especially remarkable on account of their relatively large proportion of new species. On the other hand, there is to be noted a great poverty or absence of species of *Sphœrophoron*, *Cladonia*, *Stereocaulon*, *Usnea*, *Cetraria*, *Gyrophora*, *Peltigera*, *Sticta*, *Stictina*, *Pannaria*, *Thelotrema*, and *Ocellularia*, genera of Verrucariaceæ, which for the most part require a warm and moist climate, can hardly therefore be expected to occur in any great abundance on the arid rocky land of Socotra.

The whole lichen-flora is consequently very different in character from that of Madagascar, the Mascarene and Sunda Islands, and has the greatest analogy with that of the Ægyptian deserts.

I may add, that in the investigation of the lichen-flora of Socotra, as in all my other examinations of lichens, I have not used the so-called chemical tests for the differentiation of species, as I regard "chemical species"—forms which differ from one other in no way save in chemical reaction,—as having no natural and scientific foundation. The variation in reaction is entirely physiological, dependant upon complex conditions of nutrition, and is of no systematic value in the discrimination either of species or of varieties.

Order I. COLLEMACEÆ.

Collemaceæ, Müll. Arg. Lich. Genève, 80.
Collemacei, Nyl. (Essai 163 sine charact.) Syn. 88.
Phycolichenes, Mass. Sched. crit. 139 (sine charact.).

Tribe 1. Omphalarieæ.

Omphalarieæ, Müll. Arg. Lich. Genève 31; Stitzb. Beitr. 143 pr. p.
Collemei, Nyl. Essai 163 pr. p.; Syn. 93 pr. p.
Eucollemei, Tuck. Gen. xii. pr. p.

1. ANEMA.

Anema, Nyl. in Flora 1878, p. 342.

An African genus of which three species only are known; two are Algerian. Regarding the genus, see Nylander in Flora 1878, p. 342.

A. exiguum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 457.

Thallus orbicularis, subangulosus, circiter $\frac{1}{4}$–$\frac{3}{4}$ mm. latus, planus, crassiusculus, siccus niger et minute gibboso-inaequalis, madefactus fusco-niger, monocarpicus. Gonidia 2–4-natim aggregata v. solitaria, olivacea, vel minora et magis cærulescentia, loco filamentorum ramosorum hyphemate copioso cincta. Apothecia $\frac{3}{8}$ mm. lata, sessilia, arcte adnata, plana, tenuiuscule thallodice marginata; epithecium subplanum, crassum, intense fuscum; lamina et hypothecium hyalina. Paraphyses superne incrassatæ et distincte articulatæ. Asci cylindrici, 8-spori, sporas globosas diametro 6-9 μ aequantes gerentes.

Planta habitu ad *Omphalariam Notarisii*, Mass. accedit.

Socotra. Calcicola. B.C.S. n. 1301 *pro parte.*

Distrib. Endemic.

2. SYNALISSA.

Synalissa, Nyl. Syn. 93; Stitzb. Beitr. 143.

A small genus represented mostly in the Mediterranean regions, and in the southern parts of the United States.

S. nitidula, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 457.

Thallus evolutus 2–2½ mm. latus, umbilicato-affixus, supra undique dense cæspitoso-ramilligerus, ramilli de supra visi subregulares, noduliformes, teretes, circ. $\frac{15}{100}$ mm. lati, rotundato-obtusi et nitiduli, sicci fere atri, madefacti atro-virentes, lateraliter superne gibboso-nodulosi, cæterum circiter duplo triplove longiores quam lati; filamenta interna tenella, circa gonimia nodulosa. Gonimia solitaria v. 2–4-na. Apothecia ignota.

Evidenter juxta nigram *Synalissam minusculam*, Nyl. (Lich. Angol. p. 3) locanda est. Pars exterior thalli sub microscopio nullibi rufescens, sed undique olivacea v. olivaceo-fuscescens. Gonimia subtriplo majora quam in *S. symphorea*, Nyl. et olivacea et ramilli thalli longe tenuiores. Structura thalli cæterum omnino ut in *Synalissa* et *Omphalaria*.

Socotra. Calcicola. B.C.S. n. 1467 *pro parte.*

Distrib. Endemic.

Tribe 2. Collemeæ.

Collemeæ, Körb. Par. 408.

Eucollemeæ, Nyl. Syn. 63, pr. p.; Tuck. Gen. xii. pr. p.

1. SYNECHOBLASTUS.

Synechoblastus, Trevis. Caratt. di tre nuovi gen. di Coll. p. 1 (1853).
Lethagrium, Mass. Mem. 90 (1853).
Collema, pr. p. Auct.

A genus of some twenty species, partly dispersed over all countries of the globe.

Synechoblastus of Trevisan has undoubtedly priority over Massalongo's *Lethagrium*, published in the same year, as it is quoted as synonym by Massalongo himself. The fact that *Lethagrium* is a name of Acharius (Lichenogr. Univ. 1810, p. 646), has no signification in the question, this name having been published as a section, not as a genus.

1. ? S. multipartitus, Hepp. Fl. Eur. n. 663.

Speciminula statum juvenilem 1–5 mm. latum hujus speciei bene simulant, at apotheciis primariis (spermogoniis) tantum ornata sunt. Hyphidia visa circ. 3–3½ μ longa, ellipsoideo-cylindrica, utrinque subincrassata. Gonidia subdepauperato-concatenata. Epidermis non cellulosa.

Propter defectum apotheciorum hucusque non omnino species certa.

Socotra. Calcicola. B.C.S. 1301 *pro parte.*

Distrib. This European species goes from England to the southern limestone regions of Europe. As the spores have not been observed in the Socotra specimens, the determination is necessarily somewhat doubtful, and the species therefore may not go so far southwards.

2. S. flaccidus, Körb. Syst. p. 413.

Three varieties of this species are endemic in Socotra, but the typical form of the species is widely dispersed in the temperate and colder or at least not tropical parts of the old world and in the United States.

a. var. subnigrescens, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 457.

Thallus nudus, olivaceo-fuscus, margine minus adscendens, multo minor quam in forma genuina europaea, distincte sed non crebre subradiatim (irregulariter) rugoso-plicatus. Sporæ 22–30 μ longæ, 6–8 μ latæ.

Prima fronte *S. nigrescentem*, Anzi, fallaciter simulat, sed thallus minus adpressus, minus crebre et minus regulariter rugoso-plicatus, subtus non distincte longitrorsum plicato-costatus, totus magis olivaceo-fuscus, apothecia minus numerosa et demum distincte majora et sporarum ambitus demum constanter latior et ipsæ utrinque multo minus acuminatæ.

Socotra. In ramulis Rhoidis supra Wadi Kischen, alt. 800 et 1000 m. Schweinf.

b. var. **lævis**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 457.

Thallus ut in var. præcedente sed lævis v. vix spurie gibboso-rugosus, superficie nudus, olivaceo-nigricans, pariter parvulus. Sporæ 21–24 μ longæ, 7–8 μ latæ.

Hæc thallo lævi-æquali extus ad *S. japonicum*, Müll. Arg. (L. B. 131), accedit, sed thallus multo minor, obscure tinctus et sporæ præsertim aliæ.

Socotra. Crescit cum var. præcedente. Schweinf.

Distrib. Endemic.

c. var. **subfurvus**, Müll. Arg. in. Proc. Roy. Soc. Edin. xi. (1882), 457.

Thallus paullo major, lobi magis adscendentes et subundulati, lævi-æquales v. hinc inde parce et irregulariter plicato-rugosi v. undulato-plicati, superficie demum plus minusve copiose furfuracei, vulgo steriles.

Habitu undulato-lobato subcæspitoso et superficie *Collema furvum*, Ach. simulat, sed minus rigidulus.

Socotra. B.C.S. n. 1446 (substerilis). Crescit commixtim cum duabus varietatibus præcedentibus in ramulis *Rhoidis*, et in monte Scheheli supra Tamarida alt. 1250 m. Schweinf.

Distrib. Endemic.

2. LEPTOGIUM.

Leptogium, Stitzb. Beitr. 144.
Leptogium et *Mallotium*, Mass. Mem. 95 ; Körb. Syst. Par.
Leptogium, Nyl. Syn. 118. pr. p.

A pretty numerous genus dispersed over all temperate and hot regions; some species are exceedingly common in tropical and subtropical countries.

1. Leptogium diaphanum, Nyl. Syn. p. 125.

Socotra. Ad Scheheli alt. 1250 m. (sterile). Schweinf.

Distrib. Widely-dispersed but not common, usually mixed with other lichens or with mosses ; I have it also from Cuba, New Granada, Ascension, Mauritius, Ceylon, and Australia.

2. Leptogium (Mallotium) Menziesii, Montgn. Chili, p. 223.

Rhizinæ horum speciminum, et aliorum herbarii mei, ejusdem longitudinis sunt ac in *L. Hildenbrandii*, Müll. Arg.

Socotra. In monte Scheheli alt. 1250 m. (sterile). Schweinf.

Distrib. On the mountains of South America, Cape of Good Hope, in the higher (not cold) regions of the East Indies, in China and Java at an elevation of 7000 feet.

Order II. EPICONIACEÆ.

Epiconiaceæ, Müll. Arg. Lich. Genève 19.
Coniophorei, Nyl. Ess. 167 (sine charact.).

Tribe CALICIEÆ.

Caliciеæ, Müll. Arg. Lich. Genève 19; Stitzb. Beitr. 157.
Caliciei, Nyl. Syn. 141.

Obs. The tribe of the Sphærophoreæ has not been observed in Socotra.

1. CALICIUM.

Calicium, De Not. in Giorn. Bot. Ital. 2, p. 309 (ex Th. Fries); Th. Fries Heterol. 102; Stitzb. Beitr. 157.
Calicium, Ach. pr. p., Nyl. pr. p.

A genus belonging nearly entirely to the northern hemisphere.

C. leucinum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 457.

Thallus lutescenti-albus, sat crassus, subtartareus, minute rimulosus, superficie farinulentus. Gonidia globosa, flavo-viridia. Stipites breves, cum capitulis circ. $\frac{1}{3}$ mm. longi, 50–80 μ lati, fusco-nigri et opaci, nonnihil fusco-pellucidi et superne clavatim in capitula obovoidea $\frac{13-18}{100}$ mm. lata abeuntes; capitula undique fusco-nigra et opaca, lateraliter nuda. Asci lineares, 8-spori. Sporæ 6–10 μ longæ, 5–6 μ latæ, ellipsoideæ, biloculares, atro-fuscæ.

Juxta proximum *C. populneum*, de Brond. inserendum est.

Socotra. Lignicolum. B.C.S. n. 1465 *pro parte.*
DISTRIB. Endemic.

2. SPHINCTRINA.

Sphinctrina, De Not. in Giorn. Bot. Ital. 2, p. 309; Nyl. Ess. 168, Syn. 142; Th. Fries Heterol. 103; Stitzb. Beitr. 157.
Calicii sect. *Sphinctrina*, Tuck. Gen. 241.

A much dispersed but small genus.

S. microcephala, Nyl. Prodr. p. 280.

Socotra. In thallo *Pertusariæ cicatricosæ* in ramis *Balsamodendri* supra Wadi Digal alt. 300 m. Schweinf.
DISTRIB. Europe and North and South America.

Order III. LICHENACEÆ.

Lichenacei, Nyl. Ess. 167 (sine charact.).
Gnesiolichenes, Mass. Sched. Crit. 15 (sine charact.).
Heterolichenes, Th. Fries Heterol. 42 (1861).
Eulichenes, Müll. Arg. Lich. Genève 21 (1862).

Obs. Heterolichenes, Gnesiolichenes et Eulichenes, nomina græcolatina, melius recusanda sunt.

Tribe 1. CLADONIEÆ.

Cladonieæ, Müll. Arg. Lich. Genève 22; Stitzb. Beitr. 166.

CLADONIA.

Cladonia, Hoffm. Deutschl. Flora ii. p. 114; Flörke Cladon.; Nyl. Syn. 187; Th. Fries Heterol. 76; Stitzb. Beitr. 167.
Cladonia et *Cladina*, Nyl. Syn. Lich. Nov.-Caledon. 9 et 11.

A genus of numerous and generally very polymorphous species, mostly common and more or less cosmopolitan.

C. verticillata, Flörke Cladon, p. 26.

Socotra. Terricola. B.C.S. n. 1422 (male evoluta et sterilis).

DISTRIB. Very common all over the world.

Tribe 2. ROCCELLEÆ.

Roccelleæ (Mass. Sched. Crit. sine charact.), Stitzb. Beitr. 175.
Roccellei, Nyl. Syn. 256.

This small tribe is distinguished from all other dendroid lichens by the peculiar form and evolution of the gonidia (see Schwendener Untersuch. i. p. 57, t. 6, figs. 2–17).

ROCCELLA.

Roccella, Ach. Lich. Univ. 81, t. 7, f. 8–9; Nyl. Syn. 257; Th. Fries Heterol. 50; Stitzb. Beitr. 175; Tuck. Gen. 4.

A small genus of both hemispheres of the new and the old world, and consisting of generally saxicole or rarely corticole species, found in maritime regions or in the neighbourhood of the sea.

1. R. tinctoria, DC. Flor. Franc. ii. p. 334.

NOM. VERN. Shennah (B.C.S.).

Socotra. B.C.S. nn. 1391 *pro parte*, 1408 *pro parte*, 1429 *pro parte*. Graniticola supra Wadi Kischen, alt. 1000 m. Schweinf.

DISTRIB. On maritime rocks round Africa, in the East Indies and in South America.

2. R. Montagnei, Belang. Voy. Ind. Or. p. 17, t. 13, fig. 4.

Socotra. B.C.S. n. 1317 *pro parte.* In ramis *Dracaenæ* in Wadi Kischen, 700 alt. m. Schweinf.; et in *Balsamodendro* supra Wadi Digal 300 m. Schweinf.

DISTRIB. Like the foregoing—only corticola.

var. peruensis, Krplh, Lich. Wawra, p. 10, n. 6.

Raro modice fertilis, vulgo tantum sorediifera et mollis, implexa, parvula. Soredia sæpe quam in speciminibus peruvianis paullo majora, at in ipsis peruvianis etiam magnitudine ludunt.

Socotra. B.C.S. n. 1359 *pro parte,* 1420. Supra Wadi Kischen in Acanthaceis fruticosis ad 600 et 650 m. et in superiore Wadi Digal alt. 600 m. Schweinf.

DISTRIB. Peruanus. Callao.

3. R. Balfourii, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 458.

Thallus candide opaco-albus, 2½–5 cm. altus, firmus, suberectus; laciniæ varie dichotome ramosæ v. subsimplices, tenuiores subteretes, reliqui compresso-teretes v. subinde, præsertim ad dichotomias magis compressæ, læves v. hinc inde rugosæ, sub apotheciis haud raro recurvo-ramuligeræ, apice et lateraliter fructigeræ. Apothecia primum innata, dein sensim magis emersa, demum subpodicellato-sessilia et basi constricta ut in *R. fuciformi*, Ach., margine crasso lecanorino primum integro demum undulato-sublobato cincta; discus plano-convexus, albo-v. e cæsio albido-velatus, demum denudatus et fumoso-niger; lamina fuscidula, hypothecium crassum et fusco-nigrum. Sporæ (hyalinæ et 4-loculares ut in congeneribus) latiuscule fusiformes, circiter 23 μ longæ et 6–7 μ latæ.

Habitu more congenerum valde ludens, at colore albo, laciniis primum subteretibus et apotheciis demum amplis et subpodicellatis distinguenda est. Specimina breviora simpliciuscula et apotheciis pro parte distincte terminalibus prædita capensem *Combeam molluscam*, Nyl., simulant et primo intuitu facile pro ea haberi possunt, sed planta nostra est rigidior, apothecia etiam et quidem pro longe maxima parte lateralia sunt et hypothecium omnino aliud.

Socotra. Ad saxa maritima ut videtur. B.C.S. nn. 1326, 1338 *pro parte.*

DISTRIB. Endemic.

Tribe 3. USNEÆ.

Usneei, Nyl. Syn. 265, pr. p.

USNEA.

Usnea, Ach. Lich. Univ. 127, t. 14; Nyl. Syn. 266; Th. Fries Heterol. 47; Stitzb. Beitr. 177; Tuck. Gen. 12.

A small genus, with species very widely dispersed in all regions.

U. straminea, Müll. Arg. L. B. n. 96.

Subinde in parte superiore ramulis crebërrime longe fibrillosis ornata occurrit (sterilis).

Socotra. B.C.S. n. 1428. Supra Wadi Kischen alt. 700 m. et ad Gebel Haghier alt. 1000 m. (sterilis). Schweinf.

Distrib. Mauritius. New Zealand.

Tribe 4. Ramalineæ.

Ramalineæ et *Cetrarieæ*, Nyl. Syn. 277 et 297.

The species of the vast genus *Ramalina* approach so clearly on the one hand *Cornicularia*, and *Cetraria* on the other in their vegetative characters (the bilocular spores are not a tribal character), that Ramalineæ and Cetrarieæ of Nylander, notwithstanding the usual difference in the spermogones, must be united in one tribe.

RAMALINA.

Ramalina, Ach. Lich. Univ. 122, t. 13; Nyl. Syn. 287 et Recognit. Ramalin.; Stitzb. Beitr. 175; Tuck. Gen. 5.

A genus with numerous species pretty widely dispersed in all countries.

1. R. farinacea, Ach. Lich. Univ. p. 606.

Socotra. B.C.S. nn. 1400 *pro parte*, 1449 *pro parte*. Supra Wadi Kischen alt. 600 and 700 m. (sterilis). Schweinf.

Distrib. Inhabitant of all regions.

2. R. dasypoga, Tuck. Suppl. 2, p. 203; Nyl. Recogn. Ramal. p. 16.

B.C.S. n. 1429 *pro parte*. Supra Wadi Kischen alt. 1000 m. (apothecio unico ornata). Schweinf.

Distrib. Cuba and Ceylon. A rare form.

3. R. dendriscoides, Nyl. in Flora 1876, Ramal. Cub. n. 4.

Omnino eadem est ac *R. tenella*, Müll. Arg. (L. B. n. 97), et nomen *R. dendriscoides*, Nyl. prioritate gaudet; etiam in speciminibus cubanis, C. Wright (Lich. Cub. ser. ii. n. 738), subinde laciniæ superne parce perforatæ occurrunt.

Two endemic varieties of this species known hitherto only from Cuba; Brazil, Chili, and Australia are amongst the Socotran plants.

a. var. **minor,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 458.

Planta duplo quadruplove minor, dense cæspitose crescens, dense et breviter divergenter ramulosa, laciniæ subduplo tenuiores et inferne minus distincte complanatæ quam in forma genuina speciei. Laciniæ compressæ v. tereti-compressæ, non autem planæ sunt

et juxta *R. gracilem*, Nyl., post *R. rigidam*, Nyl., optime disponenda est. Apothecia, quæ hucusque ignota, in ramillis terminalia, 1–2 mm. lata, plana, demum convexa, subtus lævia, margo integer (subinde rosellus) et prominens; discus albido-pruinosus; lamina ut in genere mos est. Asci subangusti, 8-spori. Sporæ 12–15 μ longæ, $5\frac{1}{2}$–$6\frac{1}{2}$ μ latæ, oblongo-ellipsoideæ, rectæ v. subinde obsolete curvulæ.

Eidem dein insuper adscribenda est *Ramalina sorediantha*, Krphl. (Lich. Warm. p. 370, n. 19, non Nyl. Recogn. Ram.). Quod dein sub *Ramalina erythrantha*, Müll. Arg. (Lich. Nov. Gran. n. 23), ipse descripsi non est nisi var. ejusdem late distributæ speciei,=*Ramalina dendriscoides*, Nyl. var. *erythrantha*, Müll. Arg., minutula, densissime intricato-ramosa, sorediis rubellis, crescens in Nova Granata ad Canitas alt. 1200 m.; André n. 275 bis.

Socotra. B.C.S. nn. 1360, 1365 *pro parte*, 1424. Ad ramulos *Hyperici* supra Wadi Kischen alt. 1000 m. et ibidem in *Rhoide*. Schweinf.

DISTRIB. Endemic.

b. var. **nodulosa**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 458.

Laciniæ circ. centimetrales, breviter ramulosæ, suberectæ, subirregulares et subtoruloso-nodulosæ et plus minusve albido-soredioso-tuberculatæ.

Socotra. Saxicola. B.C.S. nn. 1352, 1436, 1442 *pro parte*, 1443.

DISTRIB. Endemic.

4. **R. debilis**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1884), 458.

Thallus (unicus visus) $3\frac{1}{2}$ cm. altus, laciniæ in sectione anguloso-teretes, 1 mm. latæ, apice angustatæ, inferne parce ramosæ v. simplices, inferne nonnihil trabeculis raris connexæ, tota longitudine sat crebre foveolato-impressæ, acute angulosæ, flaccidæ, flavescenti-albidæ, infra apicem subulatum deflexum apotheciigeræ. Spermogonia atra. Apothecia visa 2–3 mm. lata, cæsio-pruinosa, dorso reticulato-rugosa, margine tenui integra. Sporæ 14–16μ longæ, $3\frac{1}{2}$–4 μ latæ, graciliter fusiformes utrinque obtusiusculæ, leviter lunatim curvatæ.

Proxime accedens ad *R. testudinariam humilem*, Müll. Arg. sed flaccido-debilis, haud rigida, magis albido-colorata. A *R. flaccescente*, Nyl., recedit laciniis haud compressis et habitu non lineari-laciniato.

Socotra. Egeling communicavit.

DISTRIB. Endemic.

Tribe 5. PARMELIEÆ.

Sticteæ and *Parmelieæ*, Auct.

This tribe comprises all foliaceous lichens, having rhizines, normal true gonidia or gonimia (but not chroolepoid gonidia), and lacanoric apothecia. Considerable differences exist between the genera in this tribe dependent upon gonidial and gonimial characters, but such is the natural affinity between *Nephroma* and *Nephromium*, and between *Sticta* and *Stictina*, that gonidial and gonimial genera cannot be placed absolutely in different tribes.

1. STICTA.

Sticta, Nyl. Syn. 351.
Sticta, Ach. pr. p. et Auct. pr. p.

A beautiful genus, dispersed over all parts of the globe except the northern. Distinguished from *Stictina* only by its true ordinary globular and simple gonidia having a fresh green not a bluish tint. An oblique section of the thallus of a *Stictina* shows a bluish hypoderma layer of cells; in *Sticta* this is absent.

S. aurata, Ach. Meth. p. 277.

Socotra. Ad ramulos supra Wadi Kischen alt. 1000 m. (sterilis). Schweinf.

Distrib. The most common species of the genus in tropical and sub-tropical regions, and also found in the western parts of temperate Europe.

2. STICTINA.

Stictina, Nyl. Syn. 333.
Sticta, Ach. pr. p. et Auct. pr. p.

A genus with numerous species forming parallel series to the corresponding series of *Sticta*, having the same geographical distribution, but with a larger representation in Europe. It often happens that species of the two genera have the strongest resemblance. In both genera the spores are sooner or later coloured fuscescent or brown.

S. Mougeotiana, Nyl. Syn. p. 340.

Socotra. Ad ramulos cum præcedente, et in Scheheli Kegel supra Tamarida alt. 1250 m. Schweinf.

Distrib. Found in many other tropical or at least warmer parts of the old world, and in French Guiana.

3. THELOSCHISTES.

Theloschistes, Norm. Conat. Præmiss. 17; Th. Fries Heterol. 51; Tuck. Gen. 18.
Physcia, Nyl. Syn. 406, pr. p.
Xanthoriæ, sect. *Theloschistes*, Stitzb. Beitr. 173.
Parmeliæ, sp. Auct.

A small genus with generally much dispersed and exceedingly common species.

T. flavicans, Norm. Conat. Præmiss. Gen. Lich. p. 17.

Socotra. B.C.S. n. 1449 *pro parte*. Ad ramos supra Wadi Kischen alt. 1000 m. Schweinf.

DISTRIB. A common species of tropical and sub-tropical regions, found also in west temperate Europe, and extending further northwards in America.

var. **intermedius**, Müll. Arg. Lich. Nov. Gran. 40.

Habitus ut in planta normali glabra speciei, sed ramilli ultimi capillacei nigrati.

Socotra. B.C.S. nn. 1364 *pro parte*, 1440 *pro parte*. Ad ramos supra Kischen alt. 800 m. Schweinf.

DISTRIB. South America.

4. PARMELIA.

Parmelia, De Not. Nuovi Caratt. de Parm. 378; Th. Fries Heterol. 58; Stitzb. Beitr. 174.
Parmelia, Ach. pr. p., Auct. pr. p.

A large genus dispersed over all regions of the globe.

1. **P. latissima**, Fée, Essai, Suppl. 119.

a. f. **isidiosa**, Müll. Arg. L. B. ad n. 190.

Ad ramos. B.C.S. n. 1412 *pro parte*. Ad saxa granitica supra Wadi Kischen alt. 900 m. et 1000 m. (sterilis). Schweinf.

DISTRIB. Warmer regions.

b. f. **sorediata**, Nyl. Syn. p. 380.

Socotra. Ad saxa granitica supra Keschen alt. 900 m. (sterilis). Schweinf.

DISTRIB. Warmer countries.

2. **P. urceolata**, Müll. Arg. var. **nuda**, Müll. Arg. L. B. n. 183.

Socotra. Ad truncos arborum supra Kischen alt. 800 et 1000 m. (utraque sterilis). Schweinf.

DISTRIB. Brazil.

3. **P. Soyauxii**, Müll. Arg. Lich. Afric. Occid. n. 9.

Similis *P. quercifoliæ* var. *revolutæ*, Schaer., microspora, subtus glabra ut in *P. latissima*, Feé.

Socotra. Saxicola supra Wadi Kischen alt. 600 m. (sterilis). Schweinf.

DISTRIB. Angola. Ascension.

4. **P. Schweinfurthii**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 458.

Habitus ut in *P. perlata* v. *ciliata*, Nyl., sed thallus nonnihil argillaceo-v. ochroleuco-albescens, opacus, subtus atro-fuscus, margine badius, fere usque ad marginem sat copiose et longiuscule rhizinoso-crinitus, ad ipsos margines longe nigro-ciliatus; laciniæ laxe adpressæ, ad margines partim adscendentes et varie incurvæ, vulgo minute isidioso-lacinulatæ et in pagina superiore hinc inde parcius v. copiose longiuscule isidiigeræ. Apothecia podicellata,

alte urceolaria, profunde concava, ore conniventia et integra, demum late aperta et $\frac{2}{3}$–1 cm. diametro æquantia, margine lacerulato-aspera et dorso granulatim v. subreticulatim aspera; discus pallide fuscus; epithecium olivaceo-fuscescens. Sporæ in ascis octonæ, 22–25 μ longæ et 12–15 μ latæ, valde pachydermeæ.

Species indumento paginæ inferioris et simul sporis sat magnis pachydermeis valde distincta.

Socotra. Crescit ad ramulos Rutaceæ cujusdam fruticosæ supra Kischen, alt. 1000 m. Schweinf.

Distrib. Endemic.

5. P. perforata, Ach. var. cetrata, Nyl. Syn. p. 378.

Socotra. Ad saxa granitica supra Wadi Kischen alt. 1000 m. (sterilis). Schweinf.

Distrib. Widely distributed in tropical and sub-tropical regions.

6. P. tiliacea, Ach. var. rimulosa, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 459.

Thallus adpressus, glauco-albescens, mox subincrassatus et crebre rimulosus, non rugosus, opacus, minute et parce isidiophorus et soredia cæsio-alba majuscula v. tubercula isidioideo-aspera sparsa gerens.—Thallus minus glaucescens quam in forma normali speciei et distincte crassior, mox rimulosus.

Similem et similiter sterilem e Brasiliæ regione bahiensi a cl. Blanchet missam, sed minus distincte sorediigeram habeo. *P. tiliacea*, Ach. var. *leucina*, Müll. Arg. L. B. n. 189, e Brasilia, thallum offert tenuiorem, nitidulum, magis angustilobum et crebre isidiosum.

Socotra. Corticola (sterilis). B.C.S. nn. 1393 *pro parte*, 1395.

Distrib. Brazil.

7. P. conspersa, Ach. var. hypoclysta, Ach. Syn. p. 391.

Socotra. Ad saxa granitica supra Kischen, alt. 650 m. (sterilis). Schweinf.

Distrib. Australia, South Europe, Texas, California.

8. P. convexula, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 458.

Thalli laciniæ dispersæ v. subcontiguæ, exiguæ, angustæ, 2–4 mm. longæ, circiter $\frac{2}{3}$–$\frac{3}{4}$ mm. latæ, adpressæ, subpinnatifidæ, flavido-cinerascentes, convexæ, læves et opacæ, subtus fusco-pallidæ et brevissime et parce rhizinosæ. Apothecia ignota.

Formam exiguam stenophyllam *Parmeliæ conspersæ*, Ach. simulat, sed laciniæ abbreviatæ, angustæ et convexulæ. Juxta *P. constrictantem*, Nyl. ap. Cromb., *P. adpressam*, Krplh. et *P. Mougeotii*, Schær. locanda est.

Socotra. Ad saxa quartzosa. B.C.S. n. 1373 *pro parte*.

Distrib. Endemic.

5. PHYSCIA.

Physcia, Th. Fries Arct. 60; Heterol. 59; Tuck. Gen. 24.
Physcia, Nyl. Syn. 406, pr. p.; Stitz. Beitr. *loc. cit.* pr. p.
Parmelia, Ach. pr. p.

A widely dispersed genus of all regions, with generally very common species.

1. P. leucomelas, Michx. Flor. Bor. Amer. 2, p. 326.

Socotra. In ramulis *Rhoidis* supra Kischen, alt. 1000 m. Schweinf.

DISTRIB. Very common in the warmer regions of the globe, and also observed in west temperate Europe.

2. P. speciosa, Nyl. Syn. p. 416, f. **sorediifera**, Nyl.

Socotra. Ad saxa granitica supra Wadi Kischen, alt. 1000 m. (sterilis). Schweinf.

DISTRIB. Like the preceding, but less rare in Europe.

3. P. crispa, Nyl. Syn. p. 423.

Socotra. Ad saxa quartzosa ad Wadi Kischen, alt. 650 m. Schweinf.

DISTRIB. In all warmer regions; not so common as the two preceding species; usually corticole.

4. P. obsessa, Nyl. Syn. p. 426.

Socotra. Ramulicola supra Wadi Kischen, alt. 600 m. (sterilis). Schweinf.

DISTRIB. Common in warmer regions.

5. P. obscurella, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 459.

Similis *Ph. adglutinatæ*, sed minor, laciniæ $\frac{1}{5}$–$\frac{1}{3}$ mm. latæ, discretæ, adplanatæ, adpressæ, incisæ, obscure olivaceo-virentes, subtus pallidæ et rudimentarie rhizinosæ, margine nudæ. Apothecia valde minuta, discus fuscus, margo cum thallo concolor et integer; epithecium fuscum; lamina et hypothecium hyalina. Asci 8-spori. Sporæ 12–15 μ tantum longæ, 7–8 μ latæ, cæterum iis congenerum conformes.

Quasi medium tenet inter *Ph. affixam*, Nyl. ap. Cromb. (Lich. Cap. p. 170) et *Ph. disjunctam*, Krplh. (Beitr. Afr. p. 141). Sporæ minores quam in *Ph. adglutinata* et tota planta tenuior.

Socotra. Ad saxa quartzosa ad Wadi Kischen, alt. 650 m. Schweinf.

DISTRIB. Endemic.

var. **fusca**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 459.

Eadem sed thallo olivaceo-fusco distincta.

Socotra. Sterilis tantum visa cum præcedente et in eodem saxo observata. Schweinf.

DISTRIB. Endemic.

6. P. endopyxinea, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 459.

Extus similis *P. stellaris*, Nyl. var. *acritæ*, Nyl. sed apothecia margine crasso, conniventer crasse lobato v. grosse crenato (persistenter thallino et cum thallo concolore) prædita. Discus cinereo-v. subcæsio-pruinosus. Lamina more Pyxinearum angusta, fuscescens et hypothecium fusco-atrum valde incurvatum, quam lamina pluries altius et circumcirca inter lobos marginis thallinos et laminam nonnihil adscendens et quasi marginem proprium fuscum rudimentarium repræsentans. Sporæ ut in *Physcia picta*, Nyl. ubi lamina multo altior et hypothecium sub angustum.

Socotra. Ramulicola, partim cum *Pyxine convexa* Müll. Arg. crescens. B.C.S. nn. 1357 *pro parte*, 1359 *pro parte*, 1361 *pro parte*, 1400 *pro parte*, 1563 *pro parte*.

DISTRIB. Endemic.

7. P. picta, Nyl. Syn. p. 430.

Socotra. Corticola supra Wadi Digal, alt. 300 m. in *Balsamodendr* (sterilis). B.C.S. n. 1354 *pro parte*. Schweinf.

DISTRIB. Extremely common in warm countries.

var. rupicola, Bagl. Lich. Beccar. Afr. p. 242, n. 9.

Socotra. Ad saxa quartzosa. B.C.S. n. 1404 *pro parte*.

DISTRIB. West Central Africa at Magumba.

var. sorediata, Müll. Arg. Lich. Afr. Occid. n. 12.

Socotra. B.C.S. nn. 1372, 1412 *pro parte*, 1415 *pro parte*. Cum forma genuina speciei et supra Wadi Kischen, alt. 600 m. (hæc ulterior sterilis). Schweinf.

DISTRIB. Very common, like the typical form.

Tribe 6. PYXINEÆ.

Pyxineæ, El. Fries Syst. Orb. Veg. 266 (exclusis *Umbilicariis*).

Thallus parmeliaceus, horizontalis, subtus rhizinis affixus. Gonidia globosa, herbaceo-viridia. Apothecia lecideina.—Differunt a *Parmelieis* apotheciis lecideinis, a *Pannarieis* autem gonidiis.

PYXINE.

Pyxine, El. Fries Syst. Orb. Veg. 267; Stitzb. Beitr. 157; Tuck. Gen. 26.

A genus of a few tropical or subtropical species, being a quasi-representation of *Physcia* with lecideous apothecia.

1. P. Meissneri, Tuck. var. endoleuca, Müll. Arg. L. B. n. 118.

Socotra. Ad truncos Aloes. B.C.S. n. 1563 *pro parte.*

DISTRIB. In the southern hemisphere of both the old and new world.

2. P. convexa, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 460.

Thallus ut in *P. cocoes*, Nyl., lævis et intus similiter albus, sed laciniæ undique convexulæ, nec ultimæ plano-concavæ. Apothecia tenuius marginata, demum convexa et subimmarginata, plus minusve e nigrescente cæsio-pruinosa; epithecium fuscum, nec virenti-fuscescens, et minus evolutum, lamina fuscescens nec virens. Sporæ a comparata specie non differunt.

Ramulorum forma non est causa convexitatis laciniarum, *Pyxines cocoes*, Nyl. specimina enim similiter ramulicola reliquis conformia sunt.

Socotra. In ramulis sæpe cæspitibus *Roccellæ Montagnei*, Nyl. subtecta. B.C.S. nn. 1358 *pro parte*, 1359 *pro parte*, 1361 *pro parte*, 1365 *pro parte.*

DISTRIB. Endemic.

Tribe 7. PLACODIEÆ.

Placodieæ, Müll. Arg. Lich. Genève 37.
Placodinæ, Körb. Syst. 110.

An intermediate tribe between the Parmelieæ and the Lecanoreæ.

1. PLACODIUM.

Placodium, Mass. Ric. 22; Körb. Syst. 114, Par. 53; Th. Fries Arct. 80; Heterol. 64; Müll. Arg. Lich. Genève 37 (non Placodium, Nyl. ol.).
Squamaria, Nyl. ol.
Lecanoræ, sp. Auct.

A widely dispersed genus, chiefly represented in temperate and colder regions, and in the mountains of tropical countries.

1. P. bullatum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 459.

Thallus cinerascenti-albus, crassiusculus, bullato-areolatus, areolæ alte convexæ, subcontiguæ, lævis, peripheriæ breviter at distincte effiguratæ, reliquis majores, planiusculæ, longiores, truncatæ, apice crenatæ et margine subrecurvo livido-discolores, omnes lævis. Apothecia ut in *Lecanora atra*, Ach., crassa, albido-marginata, margo integer, discus niger, made-

factus leviter fuscescens; epithecium obscure olivaceum v. virens, lamina virens. Sporæ octonæ (simplices et hyalinæ), 10–12 μ longæ, 5–8 μ latæ.

Tota primo intuitu fere *Lecanoram atram* aut *Physicam ægyalitam* simulat, sed thallus ad ambitum, ubi bene evolutus, clare effiguratus est.

Socotra. Ad saxa quartzosa. B.C.S. n. 1402 *pro parte.*

Distrib. Endemic.

2. P. (?) lanuginosum, Müll. Arg.

Parmelia lanuginosa, Ach. Meth. p. 207.

Amphiloma lanuginosum, Nyl. Prod. p. 69.

Pannariæ species ex forma et natura gonidiorum non est, forte juxta *Placodium fulgens* locanda.

Socotra. Ad saxa, sub fruticibus, tenui terra tecta prope Wadi Kischen, alt. 650 m. (sterilis). Schweinf.

Distrib. Europe. Generically the plant is doubtful, its fruit being unknown. Dr Nylander placed it in *Amphiloma*, near *A. gossypinum*, with which, however, it has not any affinity.

2. AMPHILOMA.

Amphiloma, Körb. Syst. 110, Par. 47; Müll. Arg. Lich. Genève 39 (non Nyl.).

Xanthoria, Th. Fries Arct. 67, pr. p.

Placodium, Næg. et Hepp, Fl. Eur. pr. p.; Tuck. Gen. 105, pr. p.

A very natural genus, formerly known only in the northern hemisphere, but containing several tropical and subtropical species. Our three species are all new and endemic.

1. A. deplanatum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 459.

Thalli circa pollicem lati forma et magnitudo ut in *A. Callopismate*, Mass., sed totus miniato-fulvus ut sæpius in *A. elegante*, Körb. laciniæ quam in illa tenuiores, undique magis æqualiter confluentes et magis adplanatæ, imo ambitu magis adpressæ et undique concolores. Apothecia paullo minora, $\frac{1}{2}$–$\frac{2}{3}$ mm. lata, magis innato-adpressa et discus cum margine concolor. Sporæ 12 μ longæ, circ. 7 μ latæ.

Species elegans, nulli nisi comparatæ speciei affinis.

Socotra. Ad saxa calcarea. B.C.S. nn. 1329, 1335.

Distrib. Endemic.

2. A. Balfourii, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 460.

Thallus orbicularis, diametro $\frac{1}{2}$–1 cm. latus, medio demum simpliciter areolatus, marginem versus late radiatim applanato-laciniatus, aurantiaco-fulvus v. nonnihil vitellino-fulvus,

lævis, nudus; laciniæ undique applanatæ, pro minutie latæ, ultimo margine crenatæ. Apothecia adpresso-sessilia, $\frac{2}{3}$–$\frac{4}{5}$ mm. lata, margine integro demum tenui cincta, discus margine paullo obscurior. Sporæ in ascis octonæ, 12–14 μ longæ, 6–7 μ latæ, medio ventricosæ, utrinque obtuse acutatæ.

Formam minutulam fere simulat *Amphilomatis deplanati*, Müll. Arg., sed thallus pallidior, centro areolatus et sporæ subsimiles iis *Amphilomatis Heppiani*, Müll. Arg.

Socotra. Ad saxa calcarea. B.C.S. n. 1468.
DISTRIB. Endemic.

3. A. granuliferum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 460.

Orbillæ thallinæ vix 1 cm. latæ, miniato-fulvæ, medio late areolato-diffractæ v. obsoletæ, margine sat regulariter applanato-radiantes v. etiam squamulæ irregulariter dispersæ; laciniæ et præsertim areolarum margines tuberculis graniformibus acute prominentibus sat exiguis concoloribus ornati. Apothecia ignota.

Habitu valde ad *Amphiloma murorum*, Körb. var. *miniatum*, Körb. et var. *obliteratum*, Körb. accedens, sed ob lacinulas omnes semper insigniter adplanatas evidenter *A. Balfourii*, Müll. Arg. magis affine et tuberculis marginalibus insignitum est. Laciniæ dorso haud raro solutæ et tum *A. cirrhochroum*, Körb. fere simulant. Thallus interdum in iisdem speciminibus non magis evolutus est quam in *R. murorum*, Körb. var. *obliterato*, Körb.

Socotra. Ad saxa quartzosa prope Wadi Kischen, ad pedem septentrionalem montium Haghier. Schweinf.
DISTRIB. Endemic.

var. subvitellinum, Müll. Arg.

Thallus e fulvo vitellinus. Reliqua visa omnia conveniunt.

Socotra. Crescit cum forma genuina speciei mixta at minus frequens.
DISTRIB. Endemic.

Tribe 8. LECANOREÆ.

Lecanoreæ, Aspicilieæ, Urceolarinæ, Auct. pr. p.
Thallus undique crustaceus, gonidia globosa, simplicia, herbaceo-viridia; apothecia lecanorina.

This tribe includes all truly crustaceous lichens, with lecanorine fruits and green globular gonidia; this last character excludes *Dirina* and *Thelotrema*, considered by other lichenographers as belonging to the Lecanoreæ.

1. CALLOPISMA.

Callopisma (thallo crustaceo, gonidiis veris globosis, apotheciis lecanorinis, sporis orculiformibus).
Callopisma, De Not. Nuovi Caratt. 24 pr. p.
Caloplaca, Th. Fries Lich. Arct. 118, et Heterol. 70.
Placodium, Stitzb. Beitr. 171, pr. p.; Tuck. Gen. 105, pr. p.
Lecanora, Ach. pr. p., Nyl. pr. p.

This genus is represented in all regions.

1. C. aurantiacum var. **salicinum**, Mass. Syn. Blasten. p. 11.

Socotra. B.C.S. nn. 1357 *pro parte*, 1361 *pro parte*, 1365 *pro parte*. Supra Wadi Digal, alt. 300 m., in cortice *Balsamodendri*. Schweinf.

Distrib. Very common almost everywhere.

var. **isidiosellum**, Müll. Arg.

Lecanora aurantiaca var. *isidiosella*, Cromb. Lich. Rodrig. in Journ. Linn. Soc. xv. p. 437.

Socotra. Cum varietate præcedente crescens sed tantum sterilis.

Distrib. Rodriguez.

2. C. citrinum, Mass. Syn. Blasten. p. 13.

Socotra. Thallus sterilis tantum adest. B.C.S. n. 1358 *pro parte*.

Distrib. Common, chiefly in temperate regions of the northern hemisphere.

3. C. steropeum, Körb. Par. p. 65.

Socotra. B.C.S. n. 1378 *pro parte*. Ad saxa quartzosa supra Wadi Kischen, alt. 650 m. (sterilis). Schweinf.

Distrib. Over Europe, and probably more widely dispersed.

4. C. pyraceum, Mull. Arg.

Caloplaca pyracea, Th. M. Fries Scand, p. 178.
Lecanora pyracea, Nyl. Scand. p. 179 pr. p.
Parmelia cerina var. *pyracea*, Ach. Meth. p. 176.

Socotra. Ad ramos. Schweinf.

Distrib. Common in Europe. Some varieties of this species are found in Australia, Egypt, and Palestine.

2. LECANORA.

Lecanora, Müll. Arg. Lich. Genève, 42 (inclus. *Zeora*, Körb. et *Aspicilia*, Mass.).
Lecanora, Ach. Lich. Univ. 77 pr. p., Nyl. pr. p.

A rich genus well represented in all regions, with a great number of very common species.

1. **L. atra,** Ach. Univ. p. 344.

Socotra. Corticola. B.C.S. nn. 1302, 1465 *pro parte,* 1467 *pro parte.* Saxicola. B.C.S. n. 1391 *pro parte.*

Distrib. Common everywhere.

2. **L. notha,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 460.

Simillima *Lecanoræ atræ,* Ach. sed thallus (crassus) minus lævis, areolæ minutissime vel obsolete rugulosæ, magis flavo-cinerascentes, et lamina omnino alia, hyalino-virescens, epithecium aeruginoso-nigricans et sporæ tantum 8–10 μ longæ, 7–8 μ latæ. Reliqua cum melanocarpica *L. atra,* Ach. conveniunt.

Juxta *L. subfuscam,* Ach. locanda est, cujus var. *atryneæ,* Ach. nonnihil habitu accedit etiamsi discus multo pallidior.

Socotra. Saxicola ad parietes septentrionales montis Bagul, alt. 500 m. Schweinf.

Distrib. Endemic.

3. **L. subfusca,** Ach. var. **chlarona,** Ach. Syn. p. 158.

Socotra. B.C.S. n. 1364 *pro parte.* Supra Wadi Digal, alt. 300 m. in ligno decorticato *Balsamodendri.* Schweinf.

Distrib. Common in tropical and warmer regions, rarer in temperate countries of both hemispheres.

4. **L. angulosa,** Ach. Lichenol. Univ. p. 364.

Socotra. Ramicola. Schweinf.

Distrib. Common in Europe. Recorded also from the higher parts of Brazil and Chili.

5. **L. socotrana,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 460.

Thallus albido-flavicans v. hinc inde sulphurascens, interdum decolorato-albescens, limitatus, crassiusculus, tenuiter rimulosus, lævis, nudus v. leviter pulverulentus, intus e flavesente albus. Gonidia globosa, 4–10 μ diametro æquantia. Apothecia 1–1½ mm. lata, adpresso-sessilia, margo integer, sæpe paullo undulatus, cum thallo concolor, interdum sulphurascens, discus planus, dein modice convexus, fuscescenti-carneus v. subgilvus, nudus v. rarius obsolete pruinosus, lamina et hypothecium hyalina. Sporæ in ascis angustis octonæ, 9–11 μ longæ, 5–5½ μ latæ.

Habitu ad *L. orosteam,* Ach. accedit, sed sporæ minores et thallus sublævis, firmus, quasi ut in *L. rimosa,* Ach. sed flavicans. Prope hanc et *L. flavido-pallentem,* Nyl. (Lecan. Cub. n. 8) et *L. glaucodeam,* ejusdem, inserenda est.

Socotra. Ad saxa quartzosa vulgaris et characteristica species insulæ, B.C.S. nn. 1356, 1402 *pro parte,* 1405 *pro parte,* 1408 *pro parte,* 1409

pro parte, 1435, 1444 *pro parte*. Ad Wadi Kischen, alt. 600–650 m. Schweinf.

DISTRIB. Endemic.

f. **livido-nigricans**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 462.

Discus apotheciorum demum e fuscescenti livido-nigricans.

Socotra. Cum forma genuina speciei. B.C.S. n. 1402 *pro parte*.

DISTRIB. Endemic.

3. RINODINA.

Rinodina, Körb. Syst. 122; Th. Fries Heterol. 71; Müll. Arg. Lich. Genève 48.
Rinodina, Mass. Ric. 144 pr. p.; Stitzb. Beitr. 169 pr. p.
Lecanora, Ach. pr. p.; Nyl. pr. p.

This genus, which corresponds exactly to *Buellia* amongst Lecideeæ, is chiefly known from colder and temperate regions of the northern hemisphere; a few species are also known from the warmer regions of the globe.

1. R. teichophila var. corticola, Arnold Ausfl. 3, p. 6, et 5, p. 18.

Socotra. In ramis fruticum supra Wadi Kischen, alt. 1000 m. Schweinf.

DISTRIB. Europe.

2. R. substellulata, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 461.

Thallus obscure cinereus v. obscure cinereo-albescens, tenuis, sublimitatus v. hinc inde effusus, tenuiter areolato-rimosus, areolæ contiguæ, planæ, læves, opacæ. Apothecia adpresso-sessilia, $\frac{2}{5}$–$\frac{1}{2}$ mm. lata, regularia, plana, margo primum thallodes, crassiusculus, mox tenuior et fuscescens v. fere lecideino-nigricans, discus madefactus et junior fuscus v. obscure fuscus, dein nigricans, bene madefactus tamen fuscescens; epithecium fuscum v. olivaceo-nigricans; lamina circ. 100 μ alta, hyalina; hypothecium hyalinum v. distincte flavescens; paraphyses subliberæ. Sporæ (fuscæ, biloculares) 15–20 μ longæ, 9–11 μ latæ, medio leviter v. vix constrictæ.

Habitu ad *Rinodinam minutulam*, Müll. Arg. accedit, sed thallus distincte areolato-rimosus et apothecia mox sublecideia. Hic forte pertinet *Lecanora sophodes*, Nyl. var. *atro-albida*, Nyl. (Lich. Port. Natal, p. 26), planta enim *Buelliam stellulatam*, Mudd. quodammodo simulat et apothecia sessilia sunt.

Socotra. Ad saxa quartzosa supra Wadi Kischen alt. 650 m. Schweinf.

DISTRIB. Endemic.

3. R. minutula, Müll. Arg. L. B. n. 121.

Thallus melius servatus quam in speciminibus antea descriptis potius flavicanti-cinereus quam cinereo-albidus dicendus est, et discus apotheciorum primum fuscus est.

Socotra. Parcissime lecta. B.C.S. n. 1378 *pro parte*
DISTRIB. Territory of Niam Niam in Central Africa

4. R. granularis, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 461.

Thallus crebre granulari-areolatus, albus vel cinerascenti-albus, areolæ valde exiguæ, angulosæ, convexæ, læves, centro monocarpicæ aut steriles. Apothecia $\frac{1}{6}$–$\frac{1}{5}$ mm. tantum lata, immersa, vertice haud emergentia et ipsa areolata albo-marginata; discus fuscus v. atrofuscus, nudus, planus; epithecium olivaceo-fuscum; lamina hyalina; hypothecium e fuscescente hyalinum. Sporæ octonæ (fuscæ, biloculares), 11–12 μ longæ, 5–6 μ latæ.
Species valde minutula, primo intuitu crustam granularem sterilem simulans.

Socotra. Ad saxa calcarea. B.C.S. n. 1355 *pro parte.*
DISTRIB. Endemic.

4. URCEOLARIA.

Urceolaria, Nyl. Essai 180; Müll. Arg. Lich. Genève 49; Stitzb. Beitr 168; Tuck. Gen. 133

A small genus with widely dispersed species.

U. actinostoma, Schær. Enum. p. 87.

Socotra. Ad saxa quartzosa supra Wadi Digal, alt. 550 m. Schweinf.
DISTRIB. Europe, Texas, Brazil, Paraguay, Teneriffe, Cape of Good Hope Egypt, East India, and China.

5. PERTUSARIA.

Pertusaria, DC. Fl. Fr. ii. p. 319; Duby Bot. Gall. 672; Schær. Enum. 226; Nyl. Essai 180; Stitzb. Beitr. 167; Tuck. Gen. 126.

This genus is represented in all countries. The Socotra lichen-flora shows a series of seven tropical species, of which five are new and endemic.

1. P. cicatricosa, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 461.

P. communis var. *neocaledonica*, Nyl. Syn. Lich. Nov. Caledon. p. 31.
Thallus mediocris, albidus v. flavescenti-albidus, rugulosus, cæterum continuus, non linea hypothallina distincta cinctus. Verrucæ fertiles 1–3-carpicæ, leviter hemisphæricæ, gibboso-subirregulares, vertice sæpe depressæ, extus undique leviter cicatricoso-foveolatæ; ostiola pallida, tarde nigrescentia, modice depressa. Asci (1–)2-spori. Sporæ oblongato-ellipsoideæ, 110–160 μ longæ, 45–60 μ latæ, intus valide subreticulatim costatæ.
A proxima *P. communi* differt superficie cicatricoso-subfoveolata fructuum.

Socotra. B.C.S. n. 1357 *pro parte.* In ramis *Balsamodendri* supra Wadi Digal, alt. 200 m. Schweinf.
DISTRIB. Endemic.

2. P. flavens, Nyl. Enum. Lich. Husn. p. 12.

Ostiola primum sulphurea, non emersa et verrucæ stictico-puncticulatæ ut in specimine originali Husnotiano, n. 471.

Socotra. B.C.S. n. 1410 *pro parte.*

Distrib. Madagascar, Guadeloupe.

3. P. schizostoma, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 461.

Thallus albescenti-flavescens, mediocris, continuus, minute rugulosus, undique cum verrucis minutissime ulcerato-puncticulatus, absque linea limitante. Verrucæ fructigeræ circ. $1\frac{1}{3}$–$1\frac{1}{2}$ mm. latæ, hemisphæricæ, superficie nonnihil gibboso-irregulares, vertice demum depressæ, circ. 5–7-carpicæ, ostiola primum punctiformia, pallida, demum elliptica v. oblongata sæpeque circa centrum subcirculariter sita, in fundo pallida. Sporæ in ascis geminatæ, 130–190 μ longæ, 56–80 μ latæ, oblongato-ellipsoideæ, demum valde pachydermeæ, intus valide costulatæ.

Similis *P. flaventi*, Nyl., sed sporæ in ascis non octonæ et thallus minus intense flavens et ostiola demum alia.

Socotra. Ramulicola. B.C.S. 1357 *pro parte*, 1361 *pro parte.*

Distrib. Endemic.

4. P. subflavens, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 461.

Thallus sulphureo-flavus, tenuis, rugulosus v. sublævis, margine subeffusus. Verrucæ fructigeræ hemisphæricæ, sæpius sat regulares, mono-v. rarius dicarpicæ, 1 mm. latæ, superficie obsolete inæquales, opacæ; ostiola haud emergentia, thallo subconcoloria, demum obscure carnea; thalamium pallidum. Asci subcylindrici, 2-spori v. rarius 1-spori. Sporæ superpositæ, circ. 110–130 μ longæ et circ. 55 μ latæ, solitariæ autem usque ad 180 μ longitudine attingentes at reliquis haud latiores.

Extus *Pertusariam flaventem*, Nyl. (Lich. Husn. p. 12) simulat, sed asci 2-spori sunt et verrucæ monocarpicæ. Juxta *Pertusariam lutescentem*, Krplh. (Süd-See-Ins. p. 11) inserari potest, a qua thallo intense flavo et verrucis 1-carpicis statim recedit.

Socotra. Ad ramulos *Hyperici* supra Wadi Kischen, alt 1000 m. Schweinf.

Distrib. Endemic.

5. P. lutescens, Krplh. Sud-See-Ins. p. 11.

A *Pertusaria cicatricosa*, Müll. Arg. thallo flavescenti, verrucis minoribus magisque regularibus sub lente recognoscenda.

Socotra. Cum *Pertusaria cicatricosa*, Müll. Arg. in ramulis et ramis *Balsamodendri* supra Wadi Digal, alt. 300 m. mixtim crescens. Schweinf.

Distrib. Hayti and Brazil.

6. P. socotrana, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 462.

Thallus pallide cinereo-flavus, mediocris, determinatus, satis minute rimoso-areolatus, areolæ planiusculæ, gibboso-inæquales, cæterum læves. Verrucæ circ. 1–1½ mm. latæ, hemisphæricæ, regulares v. ostiolis mammoso-gibbosæ, læves, 3–5-carpicæ, rarius et 1-carpicæ, ostiola plus minusve exigua, pallida, subclausa, impressa v. demum mammoso-prominentia. Asci 4-spori. Sporæ uniseriales, oblongo-ellipsoideæ, 45–80 μ longæ, circ. duplo longiores quam latæ.

Prima fronte cum californica *P. flavicunda*, Tuck., fere convenit, sed thalli areolæ subplanæ et ostiola non in disculum latiusculum nigrum aperientia. Cæterum valde ludit forma et magnitudine et superficie verrucarum interdum paullo cinerascentium.

Socotra. B.C.S. nn. 1351 *pro parte*, 1355 *pro parte*, 1374, 1399, 1400 *pro parte*, 1403, 1406, 1407, 1437, 1442 *pro parte*, 1444 *pro parte*. Ad saxa simul et calcarea et quartzosa in insula vulgatissima, in adscensu Bagul, alt. 500 m. et supra Wadi Kischen, alt. 600 m. et 900 m. Schweinf.

Distrib. Endemic.

7. P. xantholeuca, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 462.

Thallus circ. ½ mm. crassus, determinatus, ochroleucus v. e flavescente albellus, rimosus, areolæ planæ v. concaviusculæ. Verrucæ innatæ, lecanoroideæ, leviter emergentes, ⅔–¾ mm. latæ albæ, monocarpicæ; discus late apertus, nigrescens, crasse pulveraceo-albo-velatus, subplanus, hinc inde tantum phlyctidioideo-perspicuus. Asci 1-spori. Sporæ oblongatæ, 100–130 μ longæ, 50–60 μ latæ.

Juxta *Pertusariam velatam*, Nyl. et *P. monogonam*, Nyl. locanda est. Thallus fere ut in *P. socotrana*, Müll. Arg. sed multo altior et fructus diversissimi. Primo intuitu formam variolosam refert et apothecia pleraque hoc statu tantum adsunt, alia tamen immixta fertilia sunt et fere *Phlyctidis* speciem simulant, sed verrucæ, etiamsi nennissime, marginatæ sunt.

Socotra. Ad sexa quartzosa supra Wadi Kischen, alt. 900 m. Schweinf.

Distrib. Endemic.

Tribe 9. Lecideeæ.

Lecideeæ, Müll. Arg. Lich. Genève 50.
Lecideaceæ, Stitzb. Beitr. 158 pr. p.
Lecidinei, Nyl. Essai 181 pr. p.
Lecidinei, Tuck. Gen. 151 pr. p.

A group of very numerous species, and represented in all countries. It is quite analogous to the Lecanoreæ, and is divided in genera exactly on the same principles, so that *Lecidia* corresponds to *Lecanora*, *Patellaria* to *Lecania*, *Blastenia* to *Callopisma*, *Buellia* to *Rinodina*, &c.

1. BLASTENIA.

Blastenia, Mass. Syst. Lich. Blast. 13; Körb. Syst. 182; Th. Fries Heterol. 87; Müll. Arg. Lich. Genève 62.
Placodium, Næg. et Hepp, pr. p.; Tuck. Gen. 105 pr. p.

A smallish genus, widely dispersed.

1. B. poliotera, Müll. Arg. Lich. Afr. Occ. n. 23.

Lecanora poliotera, Nyl. Lich. Kurz. Beng. n. 3.

Socotra. B.C.S. n. 1380 (specimina manca). In adscensu septentrionali montis Bagne, alt. 500 m. Schweinf.

Distrib. Angola, East Indies.

2. B. albido-cærulescens, Müll. Arg. in Proc. Roy. Soc. Edin. xi (1880), 462.

Thallus cinereo-albidus, tenuis, distincte aut discreto-areolatus, areolæ angulosæ, planæ et subpolito-lævigatæ, in hypothallo cærulescente sparsæ et subcontiguæ et secus margines subcæruleo-tinctæ, cæterum paucirimosæ. Apothecia vix $\frac{1}{3}$ mm. lata, sessilia planiuscula, nigro-marginata, discus rufus v. ferrugineo-fuscus; sporæ 4–8-næ, 11–13 μ longæ, 6–7 μ latæ.

Proxima est *B. polioteræ*, Müll. Arg. et *B. variabili*, Müll. Arg., priori tamen affinior, sed thallus multo tenuior et lævigatus, albidior, non plumbeo-cinereus, areolæ planæ et hypothallus valde evolutus. Discus longe intensius rufescens quam in posteriori, cujus thallus tantum rimulosus v. rimosus, nec vere areolatus est.

Socotra Ad saxa quartzosa. B.C.S. n. 1439 *pro parte.*

Distrib. Endemic.

3. B. cretacea, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 462.

Thallus cretaceo-albus, farinulentus, tenuis, continuus, demum tenuiter rimulosus et corroso-rarescens, margine linea cæruleo-nigricante cinctus; apothecia $\frac{1}{3}$–$\frac{1}{2}$ mm. lata, sessilia, sæpius prominenter marginata, margo integer et niger, tenuis, discus planus, rufo-nigricans v. obscure ferrugineo-fuscus, demum nigrescens, nudus; epithecium cærulescens v. violaceo-nigricans; hypothecium cum lamina hyalinum. Sporæ (orculiformes) 9–10 μ longæ, 5–6 μ latæ.

Juxta ægyptiacam *B. melanocarpam*, Müll. Arg. locanda.

Socotra. Ad saxa calcarea. B.C.S. n. 1409 *pro parte.*

Distrib. Endemic.

4. B. variabilis, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 462.

Thallus subflavescenti-cinereus, tenuiusculus, demum continuus et lævis, margine sublavato-effusus, et nihilominus hinc inde zona cæruleo-nigrescente cinctus, dein sensim paullo crassior et tenuiter rimulosus demumque magis albicans. Apothecia adnato-sessilia, primum læte fulva et margine crasso concolore cincta, mox fuscescentia et tunc margine nigrescente tenuiore prædita, demum fusca, v. nigrescenti-fusca et tenuissime nigro-marginata, $\frac{2}{5}$–$\frac{1}{2}$ mm. lata; epithecium late fulvum, lamina cum hypothecio hyalina. Sporæ (orculiformes) 12–14 μ longæ, 6–8 μ latæ.

Status junior quoad thallum fere cum *B. peragrata* (*Lecanora peragrata*, Krplh. Lich. Glaz. p. 22), convenit, plane evolutus magis ad *B. polioteram*, Müll. Arg. accedit, cujus thallus aliter coloratus et areolatus est.

Socotra. B.C.S. n. 1439 *pro parte.* Ad saxa quartzosa supra Wadi Kischen, ad 600–650 m. Schweinf.

DISTRIB. Endemic.

2. LECIDEA.

Lecidea (thallo crustaceo, gonidiis globosis viridibus, apotheciis gymnocarpicis margine proprio præditis, sporis hyalinis simplicibus.)

Biatora, Müll. Arg. Lich. Genève 50.

Lecidea, Ach. pr. p.; Nyl. pr. p.

Lecidea, Lecidella, et *Biatora*, Körb.

A very large genus of all regions, with a great many common species. Cosmopolitan species have not been observed on the island.

1. L. (Biatora) contractula, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 463.

Thallus cinereo-flavicans, crassitie mediocris, determinatus, continuus, demum tenuiter rimulosus, leviter rugulosus. Apothecia vulgo in depressionibus leviusculis thalli sita, nuda, opaca, sicca subinnato-adpressa, obscure fusca et plana, madefacta fusca, distincte prominentia et immarginata et magis convexa; lamina circ. 55 μ alta, apice olivascens, cæterum cum hypothecio hyalina, epithecium distinctum deficiens; paraphyses liberæ. Asci obovoideo-cylindrici, 8-spori. Sporæ ellipsoideæ, 9 μ longæ, 5 μ latæ.

Subaffinis *L. impressæ*, Krplh., sed thallus flavicans, apothecia alia, emergentia, madefacta statim more *L. coarctatæ*, Nyl. turgescentia, sicca quasi subirregulariter contracta.

Socotra. Ad saxa quartzosa supra Wadi Kischen, alt. 600 m. Schweinf.

DISTRIB. Endemic.

2. L. (Biatora) plumbeella, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 463.

Thallus suborbicularis, modice crassus, pallide virenti-plumbeus, lævigatus, continuus, demum minute rimulosus, margine linea hypothallina fusca cinctus. Apothecia innata, haud emergentia, discus $\frac{1}{4}$–$\frac{2}{5}$ mm. latus, concaviusculus, siccus fusco-nigricans, madefactus fuscus, nudus; epithecium fuscescens; lamina cum hypothecio hyalina, circ. 100 μ alta. Asci angusti, 8-spori. Sporæ ellipsoideæ, 9–11 μ longæ, $4\frac{1}{2}$–6 μ latæ.

Nulli cognitarum nisi brasiliensi *L. impressæ*, Krplh. proxime affinis sed aliter colorata. Apothecia madefacta utriusque consimilia.

Socotra. Ad saxa quartzosa supra Wadi Kischen, alt. 650 m. Schweinf.

DISTRIB. Endemic.

3. PATELLARIA.

Patellaria, Müll. Arg. Lich. Genève 56.

Patellaria, DC. pr. p., Wallr. pr. p.

Secoliga et *Scolezites*, Stitzb. Beitr. 159 et 162 pr. p.

Biatorina, Bilimbia, Bacidia, Rhaphiospora, Scoliciosporum, Catillaria, Sagiolechia, Körb. et Massal. *Lecidea,* Ach. pr. p., Nyl. pr. p.

A large genus which is richly represented in all regions. The distinctive character of this genus is that the hyaline developed spores are never unicellular nor parenchymatic, but divided transversely. Not the number of spore-cells, but the principal of the spore division, has generic value. All the Socotran species are new and endemic.

1. P. (Biatorina) **obfuscata,** Müll. Arg. Proc. Roy. Soc. Edin. xi. (1882), 463.

Thallus effusus, tenuiter tartareo-leprosus, rimoso-areolatus, obscure rufescenti-fuscus v. demum in hypothallo nigrescenti-maculari subnullus. Apothecia sessilia, $\frac{1}{3}$ mm. lata, primum crasse dein tenuiter marginata, plana, margo primum cum thallo concolor, fuscus, mox nigrofactus, semper integer; discus semper niger et planus, opacus, nudus; epithecium fuscum, lamina circ. 50 μ alta, cum hypothecio hyalina; paraphyses sat liberæ, superne incrassatæ et fuscæ, distincte articulatæ. Asci obovoideo-cylindrici, apice valde pachydermei, 8-spori. Sporæ 18 μ longæ, $2\frac{1}{2}$ μ latæ, valide subrecto-bacillares, 2-loculares.

Juxta *Patellariam lenticularem,* Müll. Arg. inserenda est. Primo intuitu etiam *Patellariam chalybeiam,* Müll. Arg. simulat, sed hypothecium, margo, et ambitus sporarum omnino recedunt, apothecia madefacta molliora sunt quam in sect. *Catillaria* et apothecia novella margine haud omnino nigra sunt.

Socotra. Ad saxa quartzosa. B.C.S. n. 1402 *pro parte.*

Distrib. Endemic.

2. P. (Catillaria) **sigmoidea,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 463.

Thallus irregulariter evolutus, tenuiter tartareus, primum continuus, dein distincte rimoso-areolatus, v. demum subdiffracto-areolatus, lacteo-albus, hinc inde autem v. fere undique hypothallo perspicuo coerulescens. Apothecia nigra, intus inferne atro-grisea, sessilia, 1 mm. lata, primum crasse et prominenter nigro-marginata, discus planus et concolor, demum convexus et margine tenui integro cinctus; epithecium æruginoso-atrum, lamina vinoso-fuscescens, superne olivaceo-virens; hypothecium crassum, atrofuscum. Sporæ hyalinæ, 2-loculares, fusiformi-ellipsoideæ, utrinque acutatæ et sigmoideo-curvatæ.

Socotra. Ad saxa quartzosa. B.C.S. n. 1402 *pro parte.*

Distrib. Endemic.

3. P. (Bacidia) **socotrana,** Müll. Arg.

Similis *P. endoleucæ,* Müll. Arg. (pro qua eam primum habui), sed minor, apothecia prominenter crasso-marginata, epithecium fusco-atrum, hypothecium crassum, cupreo-fuscum et sporæ angustiores. Thallus albidus, granuloso-inæqualis, linea nigra cinctus. Apothecia $\frac{1}{2}$–1 mm. lata; lamina fulvescens. Sporæ 62 μ longæ, 3–$3\frac{1}{2}$ μ latæ, 9–13-septatæ.

Socotra. Ad ligna emortua. B.C.S. n. 1465 *pro parte.*

Distrib. Endemic.

4. P. (Raphiospora) decussata, Müll. Arg.

Thallus tenuis et depauperatus, minute leproso-granularis, argillaceus v. albido-argillaceus, lineis hypothallinis nigris laxe peragratus; gonidia globosa, 5–9 μ lata, glomerulosa. Apothecia sessilia, ab origine atra, evoluta $\frac{1}{3}$–$\frac{3}{7}$ mm. lata, sæpe minora, crasse et semper prominenter nigro-marginata; discus planus; epithecium virenti-nigrescens, lamina circ. 80 μ alta, superne virens, cæterum parte superiore hypothecii late hyalina, hypothecium inferne fuscescens; paraphyses capillares, subliberæ, tantum 1–1$\frac{1}{4}$ mm. crassæ. Asci 8-spori. Sporæ (hylinæ) circ. 55 μ longæ, 4 μ latæ, aciculari-fusiformes, 10–15 loculares.

Primo intuitu formam exiguam simulat *Lecideæ latypeæ*, Nyl.

Socotra. A saxa calcarea. B.C.S. n. 1460.

Distrib. Endemic.

4. BUELLIA.

Buellia, Mass. Rich. 80; Müll. Arg. Lich. Genève 63.

Buellia, De Notaris Frammenti 22 pr. p.; Tuck. Gen. 183 pr. p.

A large genus of all countries. The number of exotic species known rapidly increases, and they are predominant in the lichen-flora of Socotra. Five of our nine species are endemic.

1. B. parasema, Körb. Syst. p. 228.

Socotra. B.C.S. n. 1354 *pro parte* and 1415 *pro parte*. Ad ramulos *Balsamodendri* supra Wadi Digal, alt. 300 m. Schweinf.

Distrib. Common everywhere.

a. var. rugulosa, Körb. Syst. p. 228.

Socotra. Ad cortices. B.C.S. nn. 1354 *pro parte*, 1415 *pro parte*.

Distrib. Very common.

b. var. subæruginascens, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 465.

Thallus albicans, rugoso-areolatus ut in var. *rugulosa*, Körb., sed apothecia obsolete v. leviuscule æruginoso-pruinosa ut in var. *æruginascente*, Müll. Arg. (*Lecidea disciformi* v. *æruginascente*, Nyl. Chili, p. 166).

Socotra. Ad ramulos *Balsamodendri* supra Wadi Digal. Schweinf.

Distrib. Endemic.

c. var. contorta, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 464.

Thallus crassus, subrugoso-areolatus, magis subdecolorato-argillaceus v. ochraceo-cinereus, apotheciorum margo demum valde contortus, discus æruginascens.

Socotra. Corticola. B.C.S. n. 1563 *pro parte*.

Distrib. Endemic.

d. var. **oblongata**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 464.

Thallus (in ramulis decorticatis) cum fibris ligni commixtus maculam lævem albidam formans; apothecia parva, nonnulla orbicularia, $\frac{1}{3}$ mm. lata, adpressa, prominenter marginata, plana et nuda, reliqua numerosiora circ. triente longiora quam lata v. subinde duplo longiora quam lata, sensu fibrarum ligni oblongata. Sporæ 14–16 μ longæ, $7\frac{1}{2}$–$8\frac{1}{2}$ μ latæ.

Forma microcarpa habitu ad *Buelliam Bicasolii*, Mass. accedens, sed hypothecium crassum fuscum valde differt. Apothecia nascentia s. potius e ligno egredientia omnia modice compressa sunt. Gonidia dein vera sunt nec chroolepoidea et omnia cum genere *Buellia* quadrant. Cæterum etiam in *B. parasema*, De Not. var. *saprophila*, Körb., europaea etiam hinc inde apothecia pauca immixta nonnihil oblongata observavi.

Socotra. Ad ramulos siccos decorticatos supra Wadi Kischen, alt. 600 m. Schweinf.

Distrib. Endemic.

2. **B. brachyspora**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 464.

Apothecia parasitica, superficialia, $\frac{1}{4}$–$\frac{1}{3}$ mm. lata, tota nigra, depresso-plana, prominenter marginata, margo integer et nitidulus, discus planus, nudus, opacus; lamina circ. 40 μ alta, hyalina; epithecium fuscum; hypothecium superne hyalinum, cæterum profunde atro-fuscum, paraphyses fusco-capitulatæ. Sporæ circ. 6-næ., 7–9 μ longæ, $4\frac{1}{2}$–$6\frac{1}{2}$ μ latæ, latiuscule ellipsoideæ, utrinque late rotundato-obtusæ.

Apothecia ut in *B. athallina*, Müll. Arg. et *B. rimulicola*, Müll. Arg., sporæ autem ut in *B. leptolepide*, Bagl. et Car. et *B. vagante*, Müll. Arg.

Socotra. Crescit in thallo hinc inde evanescente *Buelliæ innatæ*, Müll. Arg. ad Wadi Kischen, alt. 600 m. Schweinf.

Distrib. Endemic.

3. **B. stellulata**, Mudd Man. p. 216, var. **protothallina**, Müll. Arg.

Lecidea stellulata v. *protothallina*, Krplh. Lich. Glaz. p. 40.

Socotra. Ad saxa quartzosa. B.C.S. hn. 1404 *pro parte*, 1405 *pro parte*, 1408 *pro parte*.

Distrib. Very common in tropical and subtropical regions; less so in temperate regions, extending northwards to Denmark and England.

4. **B. albinea**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 464.

Omnia ut in *B. stellulata*, Mudd. var. *protothallina*, Müll. Arg., sed areolæ candide albæ, 2–3-plo majores, hinc inde contiguæ, rugulosæ, rimis atris segregatæ et pro parte in hypothallo atro dispersæ. Apothecia primum albo-marginata, dein crebre diplotommoideo-crenulata, mox nigra; hypothecium longe pallidius, fuscescenti-hyalinum. Sporæ 9 μ longæ, 5 μ latæ.

Socotra. Ad saxa quartzosa. B.S.C. n. 1393 *pro parte*.

Distrib. Endemic.

5. B. leucina, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 464.

Thallus tenuiter tartareus, suborbicularis, linea nigra hypothallina cinctus, albus, lævigatus, rimoso-areolatus, secus peripheriam haud rimulosus, areolæ contiguæ, majusculæ, 1–3-carpicæ, fissuris nigris separatæ. Apothecia innata, primum margine accessorio albo-pulverulento crenato cincta, dein nuda et e superficie thalli leviter emergentia, tota concoloria, extus intusque nigra, tenuiter et obtuse nano-marginata; epithecium late atro-fuscum; lamina vitreo-hyalina; hypothecium latiuscule hyalinum, inferne late fuscum. Sporæ (2-loculares) circ. 12 μ longæ, 6 μ latæ.

Similis *B. albineæ*, Müll. Arg., sed thallus alius; apothecia ut in *B. Recobarina* (Mass.). Ex descriptione proxime ad *Lecideam rimulatam*, Nyl. accedit. Etiam *Lecidea continens*, Nyl. (ap. Cromb. Lich. Rodrig. in Trim. Journ. of Bot. v. 15, p. 442), characteribus valde accedit, sed e margine fuscescente verisimiliter est *Rinodinæ* species.

Socotra. Ad saxa quartzosa. B.C.S. n. 1400 *pro parte.*

Distrib. Endemic.

6. B. substigmatea, Müll. Arg. in Proc. Roy. Soc. Edin, xi. (1882), 465.

Thallus tenuissimus, vage effusus, continuus, lævis, olivaceo-virens, demum subrimoso-areolatus et undulato-inæqualis, semper valde tenuis. Apothecia arcte sessilia, $\frac{1}{6}$–$\frac{1}{4}$ mm. lata, plana, prominenter marginata, nigra, satis madefacta tamen fuscescentia, margo integer, ab origine niger; lamina circ. 50 μ alta, vitreo-hyalina; epithecium fuscum; hypothecium hyalino-subfuscum; paraphyses apice capitatæ. Asci latiusculi, 8-spori. Sporæ 2-loculares, 10–13 μ longæ, 7–8 μ latæ.

Juxta *B. stigmateam*, Körb. et *B. æqualem*, sc. *Lecideam æqualem*, Nyl. Lich. Kurz. Bengal. n. 9. locanda est.

Socotra. Ad saxa porphyrica. B.C.S. n. 1440.

Distrib. Endemic.

var. obfuscata, Müll. Arg. in Proc. Roy. Soc. Edin., xi. (1882), 465.

Thallus magis distincte rimoso-areolatus et olivaceo-fuscus.

Socotra. Ibidem saxicola. B.C.S. n. 1444 *pro parte.*

Distrib. Endemic.

7. B. innata, Müll. Arg. in Proc, Roy. Soc. Edin. xi. (1882), 465.

Thallus tenuiter tartareus, circ. $\frac{2}{3}$ mm. crassus, suborbicularis, linea hypothallina nigra valida cinctus, argillaceo-albidus, primum continuus, mox quoad partem superficialem rimoso-areolatus, areolæ contiguæ planæ, læves, opacæ. Apothecia in areolis, v. rarius etiam in rimis sita, tota altitudine immersa, atra, obsolete et tenuiter nigro-marginata, opaca, evoluta $\frac{1}{3}$ v. fere $\frac{2}{5}$ mm. lata, discus leviter concavus; lamina circ. 55 μ alta, hyalina; epithecium cum hypothecio crasso atrofuscum; paraphyses apice capitatæ. Sporæ octonæ, latiuscule ellipsoideæ, medio non constrictæ, utrinque rotundato-obtusæ, 9–10 μ longæ $5\frac{1}{2}$–$6\frac{1}{2}$ μ latæ.

Juxta *B. lacteam*, Körb. et *B. receptam* (Krplh.), Müll. Arg. inserenda est.

Socotra. Saxicola supra Wadi Kischen, alt. 600 m. Schweinf.
Distrib. Endemic.

8. B. recepta, Müll. Arg. Lich. Afric. occid. n. 25.

Lecidea recepta, Krplh. Lich. Glaz, p. 46.

Socotra. Ad saxa quartzosa. B.C.S. n. 1373 *pro parte*.
Distrib. Angola, and near Rio Janeiro.

9. B. africana, Müll. Arg. L. B. n. 123.

Socotra. Ad saxa quartzosa. B.C.S. n. 1351 *pro parte*, 1438.
Distrib. Recently found in New Granada and Brazil.

Tribe 10. Graphideæ.

Graphideæ (thallo crustaceo, gonidiis chroolepoideis, apotheciis gymnocarpicis [vulgo lirellinis]).
Graphideæ, Eschw. Bras. 55 (addit. generib.); Stitzb. Beitr. 151 pr. p.
Graphidei, Nyl. Essai 187 (addit. gen. ol. Lecanor.).

The most numerous and most difficult tribe of tropical and subtropical Lichens, which is also represented in temperate and colder regions by a moderately large series of species, some of which are very widely dispersed.

This group was formerly not exactly circumscribed by absolute characters. The apothecia are generally lirelline, elongated, often branched, but a good many species have nearly or quite orbicular lirellæ, not distinguishable from the apothecia of *Lecidea* or *Buellia*, and it also happens that in some true *Lecideæ*, for instance in our *Buellia parasema* v. *oblongata*, the apothecia become distinctly elongated, thus depriving *Graphideæ* of its otherwise peculiar and universal tribal character.

1. DIRINA.

Dirina, El. Fries Syst. Orb. Veg. 244; Nyl. Essai 180; Tuck. Gen. 130.
Lecaniæ sect. *Dirina*, Stitzb. Beitr. 170.

A small genus of temperate and warmer regions, having quite the habitus of a *Lecanora* (and of such *Platygraphas* as are provided with orbicular apothecia), but distinct by the structure of the gonidia.

1. D. Ceratoniæ, Fries Lich. Europ. p. 194.

Jam antea in Flora Ratisb. 1879, Lich. Beitr. n. 111, monui hoc genus a Lecanoreis separandum et propter gonidia chroolepoideo-concatenata Graphideis esse adscribendum, ubi juxta proximam *Platygraphamam* inserendum est et a qua non differt nisi præsentia marginis proprii lecideini intra marginem thallinum.

Socotra. Corticola. B.C.S. nn. 1312, 1313 *pro parte*, 1317 *pro parte*, 1318, 1337 *pro parte*.

Distrib. Mediterranean region.

2. **D. cinerea**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 465.

Thallus cinereus v. flavescenti-cinereus, madefactus virens, intus argillaceo-pallidus v. obscuratus et e flavescente et cinnabarino variegatus (non albus). Apothecia et sporæ ut in *D. repanda*, Fries, sed margo tenuior demumque subaurantiacus.

Socotra. Ad saxa calcarea. B.C.S. n. 1463, 1466 *pro parte*.

Distrib. Endemic.

var. **sorediosa**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882.)

Thallus sterilis soredia subhemisphærica circ. 1 mm. lata demum granuloso-efflorescentia gerens. (Gonidia cum specie quadrant).

Socotra. Ad saxa calcarea cum præcedente. B.C.S. n. 1466 *pro parte*.

Distrib. Endemic.

3. **D. immersa**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 465.

Thallus tartareus, tenuis, lævis et continuus v. demum obsolete rimulosus, cœrulescenti-cinereus v. incanus, linea torulosa incrassata hypothallina cinctus. Apothecia omnino immersa et prominentia thallina circulari cincta, demum a thallo plus minusve circumscisso-liberata, ½ mm. lata v. paullo minora, demum vix distincte emergentia, linea zeorina nigra præsertim statu madefacto perspicua cincta; epithecium fuscum, crassum; lamina hyalina: hypothecium eximie incrassatum, fuscum, in sectione verticali late obconicum, circumcirca inter laminam et marginem thallinum in excipulum internum angustum lecideino-nigricans adscendens. Asci 8-spori. Sporæ oblongatæ, utrinque, obtusæ, 18–19 μ longæ, 7–8 μ latæ, hyalinæ.

Socotra. Ad saxa calcarea ubi cum *D. cinerea*, Müll. Arg. commixtim provenit. B.C.S. n. 1322 *pro parte*.

Distrib. Endemic.

var. **sorediata**, Müll. Arg. *loc. cit.*

Thallus sterilis minute sorediosus. A *D. cinerea* v. *sorediosa*, Müll. Arg. dignoscitur thallo præsertim statu madefacto cœrulescenti-incano, nec cinereo-virente.

Socotra. Cum forma fertili speciei ad saxa calcarea. B.C.S. n. 132[illegible] *pro parte*.

Distrib. Endemic.

4. D. repanda, Fries Lich. Europ. p. 194.

Parmelia repanda ejusd. *loc. cit.* p. 177; *Divina repanda*, Fr.; Nyl. Lich. Alg. p. 313 pr. p., Prodr. Lich. Gall. and Alger. p. 97 pr. p. (cum *D. Ceratoniæ*, Fries, combinata).

A *D. Ceratoniæ*, Fries, differt omnibus partibus validioribus, margine thallode crasso, proprio autem multo tenuiore v. subinde subevanescente, hypothecio medio valde triangulari-incrassato et sporis crassioribus, rectis, utrinque minus distincte acutatis. Species ambæ gonidia depauperato-chroolepoidea offerunt.

Socotra. Ad saxa calcarea. B.C.S. n. 1323, 1328, 1334

Distrib. Mediterranean region.

2. OPEGRAPHA.

Opegrapha. Nyl. Ess. 188.

Opegrapha, Ach. pr. p. et Auct. pr. p.

Opegrapha, Lecanactis, Rotula, Auct.

A wide dispersed genus of all regions; the richest of the Socotra Lichen-flora. Seven of our ten species are new and endemic.

1. O. (Lecanactis) chloroconia, Müll. Arg.

Lecanactis chloroconia, Tuck. Obs. 1864, p. 285.

Ludens thallo fere nullo et disco (virenti-pruinoso) apotheciorum fere omnino v. pro parte omnino nudato.

Facile pro *Patellaria* habenda, sed gonidia concatenata sunt.

Socotra. Ad ramulos, cortices ramorum et ad truncos decorticatos. B.C.S. nn. 1314 *pro parte*, 1316 *pro parte*, 1338 *pro parte*, 1361 *pro parte*, 1456 *pro parte*.

Distrib. America.

2. O. (Lecanactis) vestita, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 466.

Thallus albus, tenuis, lævigatus, nitidulus, zona fusca cinctus; gonidia circ. 7 mm. lata, concatenata. Apothecia primum orbicularia, dein oblongata, 1–1½ mm. longa, simplicia v. altero latere uniramea, sessilia, late adnata, primum undique accessorie sat crasse thallino-vestita, marginibus incurvis turgidulis et albo-vestitis, margines proprii lecideini dein emergentes et latius disjuncti imove horizontaliter divergentes et superne demum extus et supra a thallo nudati et nigri; discus semper copiose albido-pruinosus; perithecium sub hypothecio crassius; hypothecium flavescenti-pallidum; epithecium nigricans, lamina hyalina; paraphyses laxe connexo-ramosæ. Asci cylindrici, 8-spori. Sporæ fusiformes et hyalinæ, 20–28 μ longæ, 6–7 μ latæ, 8-loculares.

Juxta *O. elegantem*, Müll. Arg. locanda est, a qua differt thallo lævigato, apotheciis emersis, extus primum insigniter thallino-vestitis, et distincte majoribus. Reliqua utriusque satis congrouunt.

Socotra. Ad ligna decorticata. B.C.S. n. 1317 *pro parte*.

Distrib. Endemic.

3. O. (Lecanactis) **elegans**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 466.

Thallus calceo-albus, tenuis, lævis v. minute verrucosus, margine zona fusca demum obsoleta cinctus. Apothecia primum orbicularia, plana, non emersa et dense cæsio-pruinosa, demum 3–6-plo longiora quam lata, curvata v. subrecta, haud raro stellatim 3-brachiata, evoluta $\frac{1}{5}$–$\frac{1}{4}$ mm. lata, et subprominenter nigro-marginata, discus planus, demum pruina rarescente cæsio-niger; paraphyses irregulares, laxe intricatim ramoso-connexæ. Asci 8-spori, angusti. Sporæ 18–27 μ longæ, absque halone 4 μ latæ, fusiformes, (5–) 7–8-septatæ, utrinque obtuse angustatæ.

Proxima *O. lynceæ*, Fries, a qua differt thallo albiore, apotheciis gracilibus et sporis brevioribus. Similiter etiam recedit ab affini *O. Martii*, Nyl. Lich. Kurzian. Calcutt. p. 5.

Socotra. Ad ligna decorticata. B.C.S. nn. 1461 *pro parte*, 1465 *pro parte*, 1467 *pro parte*.

Distrib. Endemic.

4. O. (Lecanactis) **subcalcarea**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 466.

Thallus tartareus, crassiusculus, limitatus, continuus et lævigatus, demum rimoso-areolatus, virescenti-albus, intus cretaceo-albus, non zona disclore cinctus. Gonidia chroolepoidea. Apothecia circ. $\frac{1}{2}$ mm. lata v. paullo crassiora, omnino immersa et primum regulariter orbicularia, plana, cæsio-pruinosa v. demum nigrescentia, margine valido haud prominente cincta, demum breviter et radiatim v. irregulariter obtuse 2–3-ramulosa; hypothecium atro-fuscum, validum; lamina hyalina. Asci angusti, 8-spori. Sporæ (hyalinæ) dactyloideæ, 4–6-loculares, 20–25 μ longæ, 5 μ latæ, utrinque, nonnihil obtuse angustat.

Juxta *Lecanactidem Dillenianam*, Körb. locanda est. Primo intuitu fere accurate *Siegertiam calcaream*, Körb. simulat.

Socotra. Ad saxa calcarea. B.C.S. n. 1324.

Distrib. Endemic.

5. O. (Lecanactis) **cretacea**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 466.

Thallus crassiusculus, subfarinoso-tartareus, continuus, demum obiter rimoso-areolatus, junior lævigatus, dein farinulentus, cretaceo-albus, margine linea cœrulescenti-nigra v.-fusca cinctus. Apothecia primum innata et satis similia iis *Op. subcalcareæ*, orbicularia, pruinosa, magis evoluta subinnato-sessilia, mox angulosa et reniformia, cæsio-velata, margo æcute prominens et niger, latere extus albo-farinulentus; hypothecium crassum, nigro-fuscum. Asci 8-spori. Sporæ (hyalinæ) anguste dactyloideæ, 30–34 μ longæ, 4–5 μ latæ, 7–9-septatæ, articuli sublatiores quam longi.

A subsimili *O. subcalcarea*, Müll. Arg. differt apotheciis emersis, demum prominenter anguste marginatis, sporis majoribus et magis divisis.

Socotra. Ad saxa calcarea. B.C.S. n. 1333, 1338 *pro parte*.

Distrib. Endemic.

6. O. Bonplandi, Feé Ess. p. 25.

Socotra. In ligno decorticato. B.C.S. nn. 1317 *pro parte,* 1337 *pro parte.*
DISTRIB. America and Bengal.

7. O. Dracænarum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 466.

Thallus sat tenuis, albus, lævis, superficie nonnihil farinosus, demum rugulosus, margine zona nigrescente cinctus. Apothecia $\frac{1}{5}$ mm. lata, pluries longiora quam lata, demum sæpe elongato-linearia et varie flexuoso-curvata, primum plane innata, anguste emergentia et thallo tecta, demum denudata sed non emersa, atra, opaca, rima angusta depressa albo-pruinosa v. demum atrata aperientia; perithecium integrum, margines angusti, non sulcati; hypothecium fuscum. Sporæ in ascis octonæ, hyalinæ, demum nigrescentes, 15 μ longæ, 4 μ latæ, fusiformes, utrinque obtuse attenuatæ, 4–5-loculares, loculi æquilongi.

Primo intuitu formam tenellam *Graphidis scriptæ,* Ach. v. *serpentinæ* simulat, sed structura est *Opegraphæ.* Etiam *Platygraphas stenocarpas,* Müll. Arg. simulat sed perithecium completum est.

Socotra. In ramis *Dracænarum* cum multo validiore et emersa *Graphina variante,* Müll. Arg. supra Wadi Kischen, alt. 700. Schweinf.
DISTRIB. Endemic.

8. O. microspora, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 467.

Thallus flavescenti-albus, subtenuis, lævigatus et continuus, dein rimulosus, demum evanescens et maculam albidam relinquens, evolutus linea nigra cinctus. Apothecia sæpius conferta, in thallo evoluto semiimmersa, dein thallo evanescente superficialia, $\frac{1}{4}$ mm. lata, demum 2 mm. longa, subsimplicia, primum prominenter et conniventer marginata, dein latius aperta et discum albo-pruinosum gerentia, demum late aperta, marginibus non prominentibus et disco plano denudato-nigro distincta; perithecium crassum, basi subtruncato-rotundatum; epithecium fuscum; lamina hyalina. Asci cylindrici et 8-spori. Sporæ dactyloideæ, 11–13 (–15) μ longæ, 3–$3\frac{1}{2}$ μ latæ, 3–5-septatæ.

Juxta *O. difficiliorem,* Nyl. ap. Cromb. Lich. Ins. Rodrig. in Linn. Soc. Journ. xv. p. 443, locanda est.

Socotra. Corticola. B.C.S. nn. 1316 *pro parte,* 1338 *pro parte,* 1432 *pro parte.*
DISTRIB. Endemic.

9. O. sororiella, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 467.

Thallus tenuissimus, indeterminatus, argillaceo-albus, lævis, subfarinulentus; gonidia concatenata, oblongata, circ. 12 μ longa. Apothecia subsessilia, $1\frac{1}{2}$–$2\frac{1}{2}$ mm. longa et $\frac{3}{20}$ mm. lata, linearia, arcuato-curvule, simplicia v. 3–4-radiantia, ad extremitates nunc acuta nunc obtusiora, pro latidudine sat elata, undique nigra et opaca, nuda; margines integri, subobtusi, statu sicco arcte conniventes; discus madefactus angustus, planus, niger; lamina

circ. 55 μ alta, hyalina. Asci cylindrico-obovoidei, 8-spori. Sporæ 16 μ longæ, 6 μ latæ, 4-loculares, late dactyloideæ, utrinque obtusæ.

Juxta proximam *O. simpliciorem*, Nyl. (Syn. Lich. Nov. Caledon. p. 55) inserenda est.

Socotra. Ad corticem ramorum. B.C.S. n. 1458.

Distrib. Endemic.

10. O. melanospila, Müll. Arg. Lich. Beitr. n. 56 (in Flora Ratisb. 1877).

Socotra. In thallo parasitans *Parmeliæ perforatæ*, Ach., et *P. urceolatæ*, Eschw., supra Wadi Kischen, alt. 800 m. Schweinf.

Distrib. Near Carácas.

3. MELASPILEA.

Melaspilea, Nyl. Prodr. 170; Tuck. Gen. 196.

A small but widely dispersed genus.

M. stigmatea, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 467.

Apothecia in thallo alieno immersa, nonnisi margine tenuissimo nigro-fusco leviter emergentia, orbicularia et orbiculari-elliptica, $\frac{1}{10}$–$\frac{1}{6}$ mm. longa, plana, nuda, fusco-nigra, opaca; margo basi undique continuus et tenuis et tenuiter sectus pallide tantum fusco-nigricans; epithecium pallide fuscum v. indistinctum; lamina fuscescenti-hyalina; paraphyses valde tenellæ, connexæ. Asci 6–8-spori. Sporæ evolutæ pallide fuscæ, ovoideæ, 12–14 μ longæ, 7–8 μ latæ, inæqualiter 3-loculares, sc. bilocularium loculus inferior paullo longior et angustior mox ipse transversim divisus.

Proxime accedere videtur ad *Melaspileam myriostigma*, Nyl. Lich. Kurz. Javan. n. 46.

Socotra. In thallo *Dirinæ repandæ*, Fries. B.C.S. n. 1325.

Distrib. Endemic.

4. GRAPHIS.

Graphis, Müll. Arg. Lich. Beitr. n. 454 (sporæ hyalinæ, transversim divisæ, loculi biconvexo-lentiformes).

Graphis, Ach. pr. p.; Nyl. pr. p.; Tuck. pr. p.

A large and in warmer regions richly represented genus; some northern species are dispersed everywhere.

Graphis and *Graphina* have hyaline, *Phæographis* and *Phæographina* fuscous or olive-brownish spores; the first and third have the spores divided transversely only, the second and fourth have them parenchymatous.

1. G. brachycarpa, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 467.

Thallus coerulescenti-albus, tenuis, lævis et continuus, zonula nigrescente cinctus. Lirellæ breves, $\frac{1}{2}$–$\frac{2}{3}$ v. usque 1 mm. longæ, sæpius 2–3-plo longiores quam latæ, emersæ, rigidæ,

rectæ v. subrectæ, lateraliter altiuscule valide thallino-vestitæ, rima angusta aperientes, labia nigra, obtusa, haud sulcata, crassa, basi laminæ deficientia; discus niger, subocclusus; hypothecium angustum et fuscescenti-nigricans; paraphyses simplices (generis). Asci 8-spori. Sporæ hyalinæ, latiuscule fusiformes, 20–27 μ longæ, 7–8½ μ latæ, 9–lóculares.

Species in sua sectione *Eugraphide Graphidis* valde distincta, sed vestigia tantum (apothecia 3) lecta sunt, interne bene evoluta; extus prima fronte quasi formam juvenilem et brachycarpam *Graphinæ scalpturatæ*, Müll. Arg., simulat.

Juxta *Graphidem subtractam*, Nyl., quæ tamen sporis gaudet multo majoribus et magis divisis, locanda est.

Socotra. Ad ramulos prope Wadi Kischen, alt. 700 m. Schweinf.

Distrib. Endemic.

2. **G. comma**, Nyl. in Prodr. Nov. Granat. p. 73.

Socotra. B.C.S. n. 1465. Supra Wadi Kischen ad ramulos, alt. 700 m. Schweinf.

Distrib. Exceedingly common in warmer regions.

3. **G. tenella**, Ach. Syn. p. 81.

Socotra. Cum præcedente. B.C.S. n. 1465 *pro parte*, 1467 *pro parte*. Schweinf.

Distrib. Common in tropical and subtropical countries.

5. PHÆOGRAPHIS.

Phæographis, Müll. Arg. L. B. n. 454.
Graphis, Ach. pr. p., Auct. pr. p.

A genus with moderately numerous species of the warmer regions, and also represented by a species in western Europe.

P. inusta, Müll. Arg. Lich. Beitr. n. 459.

Graphis inusta, Ach. Syn. p. 85.

a. var. **radians**, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 467.

Apothecia mediocria, stellato-radiantia, radii semel v. bis dichotome divisi, breviores quam in *Ph. inusta* var. *prorepente*, Müll. Arg., ramuli acuti.

Socotra. Corticola. B.C.S. nn. 1465 *pro parte*, 1467 *pro parte*.

Distrib. Endemic.

b. var. **simpliciuscula**, Müll. Arg.

Graphis inusta var. *simpliciuscula*, Leight. Lichenfl. of Great Britain, p. 369.

Socotra. Corticola. B.C.S. nn. 1432 *pro parte*, 1563 *pro parte*.

Distrib. England, New Grenada, Brazil, China.

6. PHÆOGRAPHINA.

Phœographina, Müll. Arg. L. B. n. 476.
Graphis, Auct. pr. p.

A large genus of tropical and subtropical regions, containing remarkable plants for this tribe.

P. Balfourii, Müll. Arg.

Graphina Balfourii, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 467.

Thallus giganteus, cresse corticiiformis, 2–3 v. hinc inde usque 5 mm. crassus, abrupte limitatus, omnino continuus et lævis, hinc inde bullatim gibbosus et per plagulas sat amplas pro genere eximie crassas secedens, supra obscure argillaceus v. argillaceo-nigricans, intus albido-v. flavescenti-argillaceus, totus coriaceo-fragilis. Apothecia 8–12 mm. longa, radiatim divisa, radiis bifurcatis v. integris, immersa et crassiuscule thallino-tecta, labiis thallinis discum tegentibus modice emergentibus, siccis conniventi-clausis sed sulcum in sectione obtuse triangularem relinquentibus, madefactis discum rufo-fuscum nonnihil detegentibus, non sulcatis; perithecium proprium $\frac{1}{2}$ mm. latum (in sectione), rufescens, versus mediam altitudinem sensim evanescens, inferne undique nullum; lamina evoluta $\frac{4}{10}$ mm. alta, undique hyalina; paraphyses subparallelæ, connexæ. Asci 1-spori. Sporæ hyalinæ, demum fuscescentes, circ. 190 μ longæ, 50–60 μ latæ, oblongato-ellipsoideæ, utrinque rotundato-obtusæ, copiosissime parenchymatice divisæ, locelli in quaque serie transversali siti circ. 8–12.

Species quam maxime insignis, habitu et affinitate ad *Phœographinam colubrosam*, Müll. Arg. (*Graphidem colubrosam*, Nyl. in Prodr. Nov. Granat. p. 564, cujus margines proprii sulcati et thallus alius), et *Phœographinam contextam*, Müll. Arg. (*Graphidem contextam*, Nyl. Syn. Lich. Nov. Caledon. p. 81, cujus sporæ pluries minores) accedit.

Socotra. Truncicola. B.C.S. nn. 1423, 1430.
Distrib. Endemic.

7. GRAPHINA.

Graphina, Müll. Arg. L. B. n. 143 et 476.
Graphis, Auct. pr. p.

A pretty genus with numerous species, which are nearly all tropical.

1. G. varians, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 468.

Thallus tenuis, albus v. albescens, sublævis, obsolete farinosus, linea nigra limitatus. Apothecia oblongato-ellipsoidea, circ. $\frac{1}{4}$–$\frac{1}{3}$ mm. lata, longitudine diametrum sesqui-duplo triplove æquantia, turgida, primum emergentia et lateraliter spurie thallodice vestita, dein emerso sessilia et denudata, recta v. flexuoso-curvata, utrinque obtusa, angustius v. latius rimali-aperta, margines valde tumidi et tereti-obtusi, haud sulcati, nigri; discus primum intense albo-pruinosus, demum denudatus, angustus et inter margines depressus; perithecium lateraliter tota altitudine crassum, basi deficiens et ibique hypothecio tenui v. hinc inde

crassiusculo fusco v. fuscescente repræsentatum. Asci 8-spori. Sporæ hyalinæ, 23–26 μ longæ, 8 μ latæ, ambitu anguste subsoleæformes, utrinque obtusæ, 8-loculares, loculi transversim 2–3-locellati.

Prima fronte *Opegraphem variam* simulat, sed discus pruinosus, sporæ omnino aliæ et perithecium dimidiatum est. In vicinitate locanda est *Graphinæ flexuosæ*, s. *Graphidis flexuosæ* Fée in Bull. Soc. Bot., 21, p. 25, cujus sporæ multo minores et ambitu latiores et apothecia alia.

Socotra. B.C.S. nn. 1313, 1316, 1337, 1338, 1354, 1356, 1363. In ramulis Dracænæ prope Wadi Kischen, alt. 700 m. Schweinf.

DISTRIB. Endemic.

2. G. socotrana, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 468.

Diorygma socotrinum, Müll. Arg. *loc. cit.*

Thallus tenuis, e pallido-argillaceo albus, continuus, lævis, subpulverulentus; apothecia thalli labiis adscendenti-conniventibus emergentibus recepta, $\frac{1}{2}$ mm. longa, sæpius triente longiora quam lata, simplicia, elliptica, utrinque spurie acutata, rarius rudimentarie uniramulosa, in sectione fere $\frac{1}{3}$ mm. lata; perithecium hyalinum, tenue; margines thallini in sectione tenues, fere hyalini, sicci medio hiantes, madefacti discum latum et planum tumescentem carneum sed cæsio pruinosum mox detegentes; epithecium hyalinum, copiose hyphemoideo-granulosum, lamina cæterum undique cum hypothecio hyalina; asci 2–6-spori; sporæ hyalinæ, 27–40 μ longæ, 13–16 μ latæ, ambitu variæ, loculi 6–10 parenchymatici, locelli loculorum transversim siti 3 v. sæpius 4.

Habitu accedit ad *Graphinam hololeucoidem*, sc. *Graphidem hololeucoidem*, Nyl. in Prodr. Nov. Granat. p. 135, sed præter alia sporis gaudet duplo et ultra minoribus et disco non crasse albo-velato.

Genus *Diorygma* retineri non potest, margo enim proprius adest hyalinus et tenuis, thallo ipso spissior.

Socotra. Ad corticem arborum. B.C.S. n. 1461.

DISTRIB. Endemic.

8. ARTHONIA.

Arthonia, Th. Fries, Heterol. 96; Müll. Arg. Lich. Genève 70; Stitzb. Beitr. 152.
Arthonia, Ach. pr. p. et Auct. pr. p.

A great genus, much dispersed everywhere; some species are extremely common, and very widely diffused.

1. A. cinnabarina, var. adspersa, Nyl. in Prodr. Nov. Granat. p. 96.

Socotra. Ad arborum truncos. B.C.S. n. 1467.

DISTRIB. Common in warmer and subtemperate regions.

2. **A. stictaria,** Nyl. Add. ad Lich. Nov. Zel. n. 7.

Socotra. In pagina superiore *Stictæ auratæ* hospitans, supra Wadi Kischen, alt. 1000 m. (non bene evoluta). Schweinf.

DISTRIB. New Zealand.

3. **A. polymorpha,** Ach. Syn. p. 71.

A. dilatata, Fée Ess. p. 54, t. 13, fig. 7, et Suppl. p. 38.

Specimina cum aliise manu Fée, in cortice Cascarillæ, bene quadrant, et sporas 4-loculares circ. 15 μ longas et 5–6 μ latas articulo superiore distincte reliquis longiore offert.

Socotra Corticola in ramulis, B.C.S. n. 1465.

DISTRIB. Central and South America. Common.

Planta Lindigiana e Nova Granata a cl. Nyl. in Prodr. Nov. Gran. p. 105, sub *Arth. polymorpha* (inclusa *Arth. dilatata* Fée sub titulo synonymi) et Glazioviana e Rio de Janeiro, sc. *Arth. polymorpha,* Krplh. Lich. Glaz. p. 75, a planta cascarillicola diversæ sunt, sporis enim 5-septatis longioribus et latioribus et apotheciis minus irregulariter lobatis gaudent.

4. **A. calospora,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 468.

Thallus albus, subtenuis, læviusculus, linea nigra cinctus, circa apothecia tumidus et illa vulgo spurie late marginans; apothecia $\frac{1}{2}$–1 mm. lata, orbicularia v. orbiculari-angulosa, raro magis oblongata, convexo-plana, sicca atra et opaca, madefacta nigro-fusca, novella nonnihil pruinoso-velata, intus subconcolori-obscura; epithecium nigrofuscum; lamina subhyalina; asci magni, obovoidei, 8-spori; sporæ hyalinæ, 50–60 μ longæ, 18–20 μ latæ, ellipsoideo-subfusiformes, vulgo incurvæ, utrinque obtusæ, 10–12-loculares, loculi late lenticulares, superior reliquis non major.

Species insignis, inter *Arth. platygraphideam,* Nyl. in Prodr. Nov. Gran. p. 204, et *Arth. cyrtodem* ejusd. *loc. cit.,* p. 66, locanda est.

Socotra. Ad ramos corticola. B.C.S. n. 1455.

DISTRIB. Endemic.

5. **A. complanatula,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 468.

Thallus hypophloeodes et cum epidermide subpulveraceo- v. pelliculoso-secedenti confusus, subindistinctus, absque linea limitante; apothecia $\frac{1}{2}$–1 mm. lata, orbicularia v. leviter angulosо-orbicularia, deplanata, subplana, immarginata, circumcirca quasi effuso-evanescentia, sicca et madefacta atra, opaca, nuda, intus concoloria, juniora griseo-velata; lamina olivaceo-virens; epithecium viridi-atrum; asci obovoidei, 8-spori; sporæ hyalinæ, 10–12 μ longæ, 4–5 μ latæ, dactyloideo-obovoideæ, utrinque obtusæ, 4-loculares, loculus superior reliquis haud major.

Habitu quoad apothecia ad *Arth. complanatam,* Fée accedit, sed sporæ duplo et ultra minores et tantum 4-loculares. Reliquæ sporis magis convenientes apotheciis gaudent multo minoribus.

Socotra. Corticola ad truncos aut ramos majores arborum. B.C.S. n. 1291, 1295, 1316.

DISTRIB. Endemic.

9. ARTHOTHELIUM.

Arthothelium, Mass. Ric. 54; Th. Fries, Heterol. 97; Stitzb. Beitr. 152.
Arthonia, Auct. pr. p.

The generally rare species of this genus are for the smaller part dispersed in hot and temperate regions, and are not so numerous as the species of *Arthonia*.

1. A. leucocarpum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 468.

Thallus albus, effusus, crassiusculus, rugulosus, nonnihil farinulentus; gonidia oblongata, concatenata; apothecia hemisphærica, subregularia, interdum geminatim confluentia, immarginata, ½–1 mm. lata, tota extus intusque alba, albo-farinosa, demum ascis carneolis hinc inde emergentibus *Stigmatidii* more puncticulata; lamina undique pallida; paraphyses creberrime reticulatim ramosæ et tenuissimæ; asci pauci tantum cylindrico-obovoidei, 8-spori sporæ hyalinæ, circ. 75 μ longæ, 18 μ latæ, 8-loculares, loculi ipsi semel v. bis cruciatim parenchymatice divisi, halo amplus, demum creberrime hyphemoideo-vestitus.

Nulli nisi *A. scriblitello* (*Arthoniæ scriblitellæ*, Nyl. in Prod. Nov. Granat. p. 102) proxime affinis est, a quo ex diagnosi loc. cit. data differt forte leviter thallo crassiore ruguloso, effuso et præsertim forma apotheciorum ambituque multo angustiore sporarum. Extus haud male simulat *Arthoniam Hampeanam*, Müll. Arg. (L.B. n. 280).

Socotra. Corticola ad ramos crassiores. B.C.S. nn. 1465, 1467.

Distrib. Endemic.

2. A. emersum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 468.

Thallus albus, effusus, tenuissimus, lævis, subfarinulentus; apothecia ½–⅔ mm. longa, emerso-sessilia, orbicularia v. sæpius dimidio et paullo ultra longiora quam lata, depresso-convexa, atra, nuda, opaca; epithecium olivaceo-nigricans v. tenuissime sectum olivaceum, lamina olivaceo-subobscura, hypothecium cum lamina concolor; asci oblongato-obovoidei, 8-spori; sporæ hyalinæ, 15–17 μ longæ, 7–9 μ latæ, ovoideo-fusiformes, æqualiter 6-loculares, loculi nonnulli longitrorsum semel divisi.

Arthothelio intervenienti, sc. *Arthoniæ intervenienti*, Nyl. in Prodr. Nov. Gran. p. 104, accedit, sed apothecia magis emerso-sessilia, crassiora, et sporæ minores minusque intus divisæ.

Socotra. Ad truncos. B.C.S. n. 1381.

Distrib. Endemic.

10. ENTEROGRAPHA.

Enterographa, Fée Meth. 17 (1824); Th. Fries, Heterol. 95; Stitzb. 153.
Stigmatidium, Mey. Flecht. 328 (1825); Nyl. Essai. 188.

A small genus, widely dispersed, with very small and rare but easily overlooked plants. Our species are of the smallest known lichens, and are all new, and as yet endemic.

Sclerophyton elegans Eschw. Bras. p. 203, a cl. Nyl. *Stigmatidio* adscriptum (in ej. Syn. Lich., Nov. Caledon. p. 58, et Lich. Husnot. p. 18), ab *Enterographa* (*Stigmatidio*) ob perithecium

basi et lateraliter inferne valide evolutum (fusco-atrum), superne nullum, separandum est, a qua etiam habitu differt. Characteres reliqui cæterum cum *Enterographa* bene quadrant, paraphyses connexæ, sporarum structura ut in *Opegrapha, Platygrapha, Dirina* et in *Enterographa. Sclerophyton* in Eschw. Syst. Lich. p. 14 fig. 8, et Lich. Bras. p. 10, Fries Plant. Homon. p. 274 (exclus. spec. cit.) expositum est.

1. E. affinis, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 469.

Thallus tenuiter tartareus, globoso-inæqualis, argillaceo-cinereus; gonidia chroolepoidea; apothecia immersa, ore orbicularia v. elliptica v. irregulariter angulosa, plana, nuda, sicca atra, madefacta atro-fusca, intus albida, circ. $\frac{5}{100}$–$\frac{6}{100}$ mm. lata; perithecium tenuissimum subproprium, olivaceo-fuscum, basi deficiens, lamina undique hyalina, paraphyses dense intricatim ramosæ, asci angusti, 8-spori; sporæ hyalinæ, fusiformes, 20–23 μ longæ, absque halone 4–5 μ latæ, evolutæ semper 6-loculares. Proxime accedit ad *Enterographam crassam* Fée Meth. p. 75 (*Stigmatidium crassum* Duby Bot. Gall. p. 643) et habitu ab ea non nisi in eo differt quod apothecia madefacta nigra v. subnigra (non statim fusco-pallescentia), magis orbicularia, sed apothecia intus pallidiora sunt et sporæ breviores (non 25–32 μ longæ), et 6-loculares, halone amplo cinctæ.

Socotra. Corticola, insulatim inter alios Lichenes. B.C.S.
Distrib. Endemic.

2. E. lactea, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 469.

Thallus cum verrucis apotheciigeris lacteo-albus, tenuis, polito-lævigatus, nitidulus, margine tenuissime effusus; verrucæ fructigeræ circ. $\frac{1}{2}$ mm. latæ, orbiculares, obtuse angulosæ, leviter convexæ; apothecia sparsa, haud emergentia, circ. $\frac{1}{25}$–$\frac{1}{20}$ mm. tantum lata, regulariter orbicularia, sicca et madefacta nigra, nuda; perithecium lateraliter tenuissimum, fuscum, basi deficiens; hypothecium crassum et hyalinum, basi autem flavescens; lamina superne fuliginea, cæterum hyalina; epithecium nigricans; asci cylindrico-obovoidei, 8-spori; sporæ hyalinæ et anguste fusiformes, 23–28 μ longæ, 4 (cum halone) mm. latæ, 8–10-loculares, loculi quoad longitudinem sat æquales. Nulli nisi neocaledonicæ *Enterographæ subseriali*, s. *Stigmatidio subseriali*, Nyl. Syn. Lich. Nov. Caledon. p. 58, affinis, a qua tamen colore lacteo-albo et superficie lævigata thalli et sporis duplo minoribus et insuper minus divisis distinguitur.

Socotra. Crescit corticola ad ramos crassiores. B.C.S. n. 1337.
Distrib. Endemic.

3. E. fraterculans, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 469.

Thallus crassiusculus, leviter alboflavicans, in verrucis thallinis subirregulariter orbicularibus depresso-hemisphæricis apothecia centro confertim gerens; apothecia tantum $\frac{1}{20}$ mm. lata, immersa et leviter depressa, demum magis sensu radiali verrucarum oblongata sæpeque partim in lineolas breves submoniliformes 2–3-plo longiores quam latas confluentia, fusca, nonnihil cinereo-pruinosa; perithecium cum epithecio fuscum, tenue, basi deficiens; hypothecium pallidum; asci elongati, 8-spori; sporæ hyalinæ, subdactyloideæ, 24–27 μ longæ, 6–8 μ latæ, 3 septatæ.

Satis simile præcedenti, sed thallus alius et sporæ omnino aliæ. *Enterographa granulata* (*Stigmatidium granulatum*, Nyl. Enum. p. 132), et *E. compuncta* (*Stigmatidium compunctum*, Nyl. *loc. cit.*) jam habitu et sporis multo tenuioribus differunt.

Socotra. Corticola B.C.S. n. 1455.
Distrib. Endemic.

11. MINKSIA.

Minksia, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 469.

Thallus crustaceus, areolatus, areolæ demum pro parte verruciformes et fertiles; gonidia chroolepoidea; apothecia gymnocarpica, in verrucis thallinis planis demum convexis sita, perithecium simplex, proprium, immersum, lateraliter tenuissimum, completum, basi demum crassius; epithecium distinctum; paraphyses connexæ; sporæ hyalinæ, pluriloculares, loculi cylindrici, pro parte locellati. Habitus *Enterographæ* et *Chiodectonis*, sed sporæ parenchymaticæ.

A new genus with two endemic species.

1. M. cæsiella, Müll. Arg. *loc. cit.* 470.

Thallus cinereus v. e flavescente cinerascenti-albus, crassiusculus, lævis, dein rimosus v. rimoso-diffractus, demum pulverulentus, margine effusus; gonidia depauperato-chroolepoidea; apothecia orbicularia et irregulariter elliptica, $\frac{1}{3}$–$\frac{1}{2}$ mm. lata aut minora, plana, primum distincte depressa, nulla prominentia thallina cincta, cæsio-velata, dein thalli superficiem attingentia et denudata, atra, a thallo nonnihil circumscisso-remota, demum leviter emergentia et convexiuscula; perithecium integrum, fuscum v. fusco-atrum, basi rufescenti-fuscum et sæpe paullo crassius, epithecium fuscum, lamina hyalina, hypothecium supra partem basalem perithecii latiuscule rufescenti-hyalinum; asci cylindrico-obovoidei, 8-spori, sporæ (6–) 8-loculares, 20–28 μ longæ, $6\frac{1}{2}$–7 μ latæ, loculi intermedii nonnulli semel longitrorsum divisi.

Socotra. Corticola ad ramos majores. B.C.S. n. 1295, 1337.
Distrib. Endemic.

2. M. candida, Müll. Arg. *loc. cit.* 470.

Fere omnia ut in præcedente, sed thallus albus, reticulatim rimosus, superficie farinoso-rugulosus, margine linea atra cinctus, demum depresso-verrucosus, apothecia magis oblongata, sigmoideo-curvata, semper depressa et semper albido-pruinosa; sporæ ut in præcedente.

Hæc insuper a *M. cæsiella* in eo recedit quod perithecium (basi primum tenue ut ad latera) mox totum sat profunde in thallum conico-descendens ut in genere *Chiodectone*. Ex hoc charactere et apotheciis internis, primum punctiformibus, non thallino-marginatis, affinitas generis cum *Chiodectone* clare apparet, etiamsi *Graphinis* quibusdam habitu satis accedat.

Socotra. Corticola. B.C.S. n. 1432, pr. p.
Distrib. Endemic.

12. CHIODECTON.

Chiodecton, Ach. Syn. p. 212; Nyl. Essai 190; Stitzb. Beitr. 152.

A small genus of nice habitus; the species are generally tropical, but three are found in the western and southern Europe.

1. C. nanum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 470.

Thallus albus, crassiusculus, æqualis et lævigatus, determinatus, non linea aut zona hypothallina cinctus, demum tenuissime rimulosus; verrucæ fructigeræ vix emergentes, levissime convexæ et thallo leviter albiores, irregulariter oblongæ; apothecia irregulariter subseriatim disposita, immersa, extus punctulis depressis fumoso-nigricantibus tantum $\frac{1}{50}$–$\frac{1}{20}$ mm. latis distincta, pro parte gregatim approximata aut astroideo-confluentia, tota in sectione verticali fere $\frac{1}{5}$ mm. lata, basi profunde convexo-angustata et undique cum marginibus tectis completis sed valde tenuibus ($\frac{1}{80}$–$\frac{1}{100}$ mm. crassis) nigra; sporæ in ascis subangustis octonæ, hyalinæ, fusiformes, 21–24 μ longæ, 5 μ latæ, 5–7-septatæ, loculi æquales.

Affine *Ch. effuso* Fée sed verrucæ nanissimæ, multo minores, apothecia conferta et minora et sporæ 6–8-loculares.

Socotra. In ramis Dracænæ cum *Graphina variante* et *Opegrapha Dracænarum*, supra Wadi Kischen, alt. 700 m. Schweinf.

Distrib. Endemic.

2. C. circumscissum, Müll. Arg. Proc. Roy. Soc. Edin. xi. (1882), 470.

Thallus argillaceo-cinereus, lineis nigris crebre decussatus, tenuis, obsolete v. demum distincte verrucigerus, superficie lævis; gonidia chroolepoidea; apothecia in verrucis convexis mediocribus subirregularibus conferta, orbicularia v. oblongata, depressa, primum cæsio-v. albido-pruinosa, mox nudata et nigra, $\frac{1}{6}$–$\frac{1}{4}$ mm. lata, semper distincte depressa et a thallo nonnihil arrecto circumscisso-libera, subinde pro parte astroideo-confluentia et *Arthoniam* simulantia; perithecium lateraliter tenue, basi autem profunde conice in thallum descendens, atro-fuscum, epithecium fuscum; lamina hyalina; asci 8-spori; sporæ hyalinæ, circ. 36 μ longæ, 5 μ latæ, more *Platygrapharum* 9–12-loculares.

Prope *Chiodecton Kurzei*, Nyl. Lich. Andam. p. 13 locanda videtur.

Socotra. Corticola ad ramulos minores. B.C.S. n. 1319.

Distrib. Endemic.

3. C. socotranum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 470.

Thallus fere 1 mm. crassus, tartareus, albus, primum continuus v. obsolete rimulosus, dein areolato-rimosus, farinulentus, hinc inde linea fusca v. nigra hypothallina cinctus; verrucæ fertiles albo-virentes et thallo læviores, 1–5-carpicæ, irregulariter depresso-hemisphæricæ, modice tantum emersæ et basi haud contractæ; ostiola punctiformia, nigra, subastroideo-confluentia, haud peculiariter marginulata; epithecium fuscum; lamina hyalina; hypo-

thecium crasse obconicum et atro-fuscum; perithecium lateraliter distinctum sed tenue fuscum; asci angusti, 8-spori; sporæ (hyalinæ) 23–26 μ longæ, $5\frac{1}{2}$–$6\frac{1}{2}$ μ latæ, 3-septatæ, rectæ, fusiformes, utrinque obtusiusculæ.

Nulli cognitorum arcte accedens.

Socotra. Ad saxa calcarea. B.C.S. n. 1346.

DISTRIB. Endemic.

4. **Chiodecton farinaceum**, Fée, Ess. Suppl. p. 50.

Socotra. Ad ramulos tantum sterile lectum sed planta cæterum optime cum hac specie convenit. Ad Wadi Kischen. Schweinf.

DISTRIB. Brazil, New Grenada, Western Africa, and Australia.

Tribe 11. ENDOPYRENIEÆ.

Endopyrenieæ, Schwendener Unters. Flechtenth. 25; Müll. Arg. Lich. Genève p. 72.

NORMANDINA.

Normandina, Nyl. Essai 191; Stitzb. Beitr. 149; Tuck. Gen. 251.
Endocarpi, sp. Leight. Brit. Ang. Lich. 13 t. 3 f. 1.

A small genus of only two species, one of which is much dispersed.

N. **Jungermanniæ**, Nyl. Prodr. p. 173.

Socotra. Inter lobos thalli Parmeliarum, in ramis supra Wadi Kischen, alt. 1000 m. Schweinf.

DISTRIB. Long known in western and central Europe, now reported from many exotic stations both in the old and new world (southern part of United States, California, Mexico, New Grenada, Brazil, Ceylon, and Australia).

Tribe 12. VERRUCARIEÆ.

Verrucarieæ, Müll. Arg. Lich. Genève 75.
Verrucariei, Tuck. Gen. 253.
Endocarpei, Nyl. Essai 190 pr. p.

A very numerous and natural tribe, represented everywhere.

1. VERRUCARIA.

Verrucaria, Næg. et Hepp, Fl. Eur.; Müll. Arg. Lich. Genève, 73.
Verrucaria et *Thrombium*, Stitzb. Beitr. 148; Th. Fries Heterol. 109.
Verrucaria, Ach. pr. p.; Nyl. pr. p.

This genus has numerous European species, but a few only are found to-day in warmer regions. From this genus are excluded all species of authors not having simple and rot hyaline spores.

1. V. rupestris, Schrad., var. **alocizoides,** Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 471.

Thalli plagulæ irregulariter orbiculari-angulosæ, vix ½ cm. latæ, varie confluentes, linea hypothallina nigra cinctæ et thallum compositum crebre geographicum et subsulcato-peragratum formantes; sporæ 18–24 μ longæ, 11–15 μ latæ.

Primo intuitu *Verrucariam calcisedam* v. *alocizam* Arn. simulat, sed apothecia et sporæ majora.

Socotra. Ad saxa calcarea. B.C.S. n. 1332.

DISTRIB. Endemic.

2. V. prominens, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 472.

Thallus tenuis, effusus, continuus, lævis, olivaceo-virens, dein diffracto-areolatus et pallidior v. demum ochraceo-argillaceus; apothecia ⅛–⅐ mm. lata, elato-semiglobosa, basi truncata, nigra, scabridula, primum thallo leviter velata, mox prominenti-emersa et nuda, vertice rotundato-obtuso integra, perithecium integrum sed basi tenuius; paraphyses molliusculæ, apice subclavatæ et ibidem 3 μ latæ, distanter septatæ; asci 8-spori, oblongato-obovoidei, pachydermei; sporæ (hyalinæ et simplices) oblongato-ellipsoideæ, 15–21 μ longæ, 7–8 μ latæ.

Ad chaoticam *Verrucariam margaceam*, Nyl. Pyren. p. 25 referri possit. Apothecia magis emergentia quam in *V. elaeina*, Mass. Körb., demum magis elevato-hemisphærica, cæterum ei proxima.

Socotra. Ad saxa quartzosa. B.C.S. n. 1378.

DISTRIB. Endemic.

2. MICROGLÆNA.

Microglæna, Körb. Syst. 388 (1855); Stitzb. Beitr. 149.
Thelenella, Nyl. Essai 193 (1855).

A very small northern genus.

M. saxicola, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 471.

Fere omnino cum europaea et corticola *M. Wallrothiana*, Körb. conveniens, sed thallus paullo obscurior, subfusco-olivaceus, mox rimoso-diffractus, verrucæ thallinæ (1-v. rarius 2–3-carpicæ) leviter minores, apice non vel vix distincte umbilicato-depressæ et circa ostiolum fuscum minus pallidiores et sporæ ambitu angustiores; gonidia globosa; perithecium globosum, hyalinum apice atro-fuscum (pars fusca non est epithecium), nucleus hyalinus, paraphyses capillares, 1½ μ latæ, inferne intricatim connexæ; sporæ hyalinæ, 28–33 μ longæ, 9–11 μ latæ, transversim circ. 7–9-septatæ, loculi suboblique longitrorsum 2–4-septati.

Socotra. Ad saxa quartzosa supra Wadi Kischen, alt. 650 m Schweinf.

DISTRIB. Endemic.

3. MICROTHELIA.

Microthelia, Körb. Syst. 372; Th. Fries Heterol. 111; Stitzb. Beitr. 147.
Verrucaria, Nyl. pr. p.

A small genus, widely dispersed.

M. micula, Körb. Syst. Lich. Germ. p. 373 (1855).

Socotra. Corticola ad ramulos. B.C.S. n. 1410.
DISTRIB. Europe (not rare), North and South America.

4. PYRENULA.

Pyrenula, Stitzb. Beitr. 148.
Pyrenula et *Blastodesmia*, Mass., Th. Fries.
Verrucaria, Nyl. pr. p.

A genus with numerous and some very common tropical species, a few are European.

P. obscurata, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 471.

Thallus pro genere crassus, subcartilagineus, olivaceo-fuscus, superficie undulato-inæqualis; gonidia rhomboidea, depauperato-concatenata, aurea, rarescentia; apothecia spersa, distantia, omnino immersa, primum obtecta, demum vertice anguste v. subanguste nuda, atra, vertice nitidula et demum minute umbilicato-pertusa; perithecium integrum, globosum, undique crassum et basi crassius, totum in sectione fere $\frac{1}{2}$ ($\frac{45}{100}$) mm. latum; paraphyses tenellæ, capillares; asci cylindrici, 8 spori; sporæ fuscæ, 23 μ longæ, 10–12 μ latæ, 4-loculares, loculi intermedii rhomboidales, terminales obconici.

A proximis *P. cerina* (*Verrucaria cerina*), Eschw. Brasil. p. 133, et a *P. hypophyta* (*Verrucaria hypophyta*, Nyl. in Prodr. Nov. Granat. p. 119) præsertim thallo omnino alio et apotheciis majoribus differt.

A *P. punctella* (*Verrucaria punctella*, Nyl. in Prodr. Nov. Granat. p. 119) similiter et sporis minoribus recedit.

Socotra. Corticola ad ramos. B.C.S. n. 1354.
DISTRIB. Endemic.

5. ANTHRACOTHECIUM.

Anthracothecium, Mass. Esam. compar. 49; Müll. Arg. Lich. Afric. occid. n. 52.
Verrucaria, Nyl. pr. p.

A genus of the warmer regions, having quite the habit of *Pyrenula*, but provided with parenchymatous (brownish) spores.

A. libricolum, Müll. Arg. Lich. Afric. Occid. n. 52.

Verrucaria libricola, Nyl. Syn. Lich. Nov. Caled. p. 87.
V. aspistea, Nyl. Pyren. p. 43 (non. Ach.).
Pyrenula libricola, Fée Ess. Suppl. p. 83.

Socotra. Ad ramos. Schweinf.
DISTRIB. Cosmopolitan in tropical and subtropical regions.

6. POLYBLASTIA.

Polyblastia, Th. Fries, Polybl. 8.
Polyblastia, Mass. pr. p., Körb. pr. p.
Verrucaria, Nyl. pr. p.

This genus has many species in Europe, but few in the warmer regions.

P. tropica, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 471.

Thallus cum cellulis corticis confusus, maculam albescentem efficiens, effusus; apothecia nuda v. basi albo-velata, depresso-hemisphærica, in sectione basi fere $\frac{1}{2}$ mm. lata, $\frac{1}{10}$–$\frac{1}{8}$ mm. alta, atra, superne nitidula, demum vertice poro pertusa, perithecium dimidiatum, basi circumcirca incurvatum et simul extrorsum subattenuatum, basi sub nucleo undique deficiens; nucleus vitreo-hyalinus, superne tamen pallide olivaceus, hypothecium hyalinum, asci 3–4-spori; sporæ oblongato-ellipsoideæ (hyalinæ), 25–28 μ longæ, circ. 10 μ latæ, 6–8-loculares, loculi 2–4-locellati.

Apothecia ut in *P. sericea*, Mass., sed sporæ in ascis paucæ.

Socotra. Corticola ad ramulos. B.C.S. n. 1465.
DISTRIB. Endemic.

7. BATHELIUM.

Bathelium, Ach. Meth. 111, t. 8, f. 3; Trev. Synops. gen. Trypeth. 21.
Trypethelium, Nyl. pr. p.

A tropical genus with a few species, having the structure of the fructification as in *Trypethelium* combined with hyaline and parenchymatous spores. Our species are new and endemic.

1. B. pauperrimum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 471.

Thallus hypophloeodes, gonidia fere globosa et parva, plus minusve seriato-concatenata; perithecia ab epidermide tecta, demum quasi poro ad verticem paullo denudata, solitaria v. hinc inde pauca confluentia et tunc stroma minutulum fusco-nigricans distincte sed leviter prominens formantia, vere dimidiata, depresso-hemisphærica, basi circumcirca sæpe acute subproducta et epidermidem nigrantia, evoluta cum epidermide nigra, desupra visa $\frac{1}{3}$–$\frac{2}{5}$ mm.

lata, basi autem in sectione $\frac{6}{10}$ mm. lata; hypothecium tenue et fuscescens v. hyalinum; paraphyses tenues, laxæ et laxe clathratim ramosæ; sporæ in ascis 2–3–8-næ, hyalinæ, absque halone lato circ. 25 μ longæ et 4–10 μ latæ, evolutæ transversim 4–5-septatæ, loculi 1–3-locellati.

Simile *Trypethelio fusco*, Krplh. Lich. Warm. p. 398, nulli cognitorum nisi *B. subdiscreto*, s. *Trypethelio subdiscreto*, Nyl. Lich. Kurz. Bengal. n. 22 affine est, a quo perithecio dimidiato et sporis subduplo minoribus differt.

Socotra. B.C.S. nn. 1357, 1467 (hæc sine sporis, cæterum congrua). Ad ramulos supra Wadi Kischen, Alt. 700 m. Schweinf.

Distrib. Endemic.

2. B. velatum, Müll. Arg. in Proc. Roy. Soc. Edin. xi. (1882), 472.

Thallus vix nisi hyphemoideus circa perithecia; gonidia evoluta deficientia (saltem non observata); stromata suborbicularia, $1\frac{1}{2}$–2 mm. lata, depresso-hemisphærica, circumcirca effusa, cortice obscurato v. cinerascente tecto-velata, 1–10-carpica; perithecia immersa, dimidiata, basi lateraliter inflexa cæterumque ibidem basi nulla, olivaceo-fuscescentia, primum longicolla, dein e cortice erumpentia et superficiem verrucarum attingentia aut illas paullo superantia, ostiolum albo-pulverulentum, demum nudatum et atrum, minutulum; lamina undique cum hypothecio hyalina v. hypothecium basi angustissime olivaceum; paraphyses connexæ; asci oblongo-obovoidei, 1–8-spori; sporæ semper hyalinæ, 25–38 μ longæ, 10–16 μ latæ, locelli in seribus 6–8 transversis 2 v. sæpius 3.—Paraphyses contextum laxum at satis firmum tenacem præbent in quo nidulantur asci.

Ob defectum gonidiorum in statu fructigero observato facile ad Fungos relegandum, at microgonidia in paraphysibus et sporis adsunt sed minus facile observanda sunt.

Affine est dissimili *B. pauperrimo.*

Socotra. Corticolum ad ramos majores. B.C.S. nn. 1330, 1354, 1381, 1410.

Distrib. Endemic

PYRENOMYCETES.

By Dr M. C. COOKE.

SPHÆRIACEI.

1. SPHÆRIA.

Sphæria, Haller (1768), Helv. iii., Fries. Syst. Myc. ii. 319.

A very large genus, recently subdivided into numerous smaller ones with little more than subgeneric value. Largely distributed throughout temperate countries but comparatively scarce in the tropics.

1. Sph. (Rosellinia) **opaca**, Cooke.

Subgregaria. Peritheciis globoso-depressis, atris, opacis (·25 mm. diam.), vix papillatis, superficialibus, ascis cylindraceis, octosporis. Sporidiis globoso-ovalibus (·007 × ·006 mm.) fuscis, uniserialibus.

Socotra. On rotten wood. B.C.S. n. 1305.
DISTRIB. Endemic.

2. Sph. (Immersa) **hyalodidyma**, Cooke.

Sparsa, immersa. Peritheciis subglobosis, atris, ostiolo punctiformi emergente. Ascis cylindraceis. Sporidiis ellipticis, uniseptatis, hyalinis (·012–·014 × ·0075 mm.)

Socotra. Immersed in wood. B.C.S. n. 462.
DISTRIB. Endemic.

3. Sph. (Kalmusia) **rubronigra**, Cooke.

Sparsa. Peritheciis in ligno subimmersis, demum supra denudatis, primitus pulvere rubro conspersis, dein nudis, atris, nitidis, ostiolo brevi. Ascis cylindraceis. Sporidiis uniseriatis, ellipticis, triseptatis, fuscis (·022 × ·008 mm.).

Socotra. On naked wood. B.C.S. n. 1465.
DISTRIB. Endemic.

4. Sph. (Thyridium) **colliculus**, Cooke.

Peritheciis subglobosis minimis, in stromate nigrofacto elevato elliptico (4 × 1 mm.) congestis, immersis; ostiolis punctiformibus. Ascis clavatis cylindraceisque, octosporis. Sporidiis uni- vel biseriatis, ellipticis, 5 septatis, muriformibus, hyalinis (·02 × ·01 mm.)

Socotra. On naked wood. B.C.S. nn. 1317, 1563.
DISTRIB. Endemic.

2. LOPHIOSTOMA.

Lophiostoma, Fries Syst. Myc. ii. 467; Sacc. Syll. ii. 689.

A genus including, in its widest sense, about 150 species, chiefly inhabiting temperate countries.

1. L. (Lophiotrema) **Socotræ**, Cooke.

Laxe gregaria. Peritheciis ligno immersis, deinde plus minus emergentibus, subsphæroideis, compressis, atris, ostiolis umbilicatis. Ascis saccato-clavatis, octosporis. Sporidiis lanceolatis, inordinatis, 7-septatis, hyalinis (·035 × ·008 mm.)

Socotra. On naked wood. B.C.S. n. 1461.
DISTRIB. Endemic.

3. EUTYPA.

Eutypa, Tul. Sel. Fung. Carp. ii. 52; Sacc. Syll. i. 162.

A genus of about fifty-six species, mostly European or of the temperate part of North America.

1. E. Acharii, Tul. Sel. Fung. Carp. ii. 53, t. 7, ff. 8–20; Sacc. Syll. i. 162.

Socotra. On dry rotten wood on Galonsir Plain. B.C.S. 1344 *bis*.

Distrib. Europe and North America.

2. E. aspera, (Nits.) Fuck. Symb. Myc. 214; Sacc. Syll. i. 163,
var. **lignicola**, Cke.

Socotra. B.C.S. n. 1307 A.

Distrib. of the species,—Europe, N. America; of the variety,—Socotra.

4. VALSA.

Valsa, Adans. Fam. ii. 9; Fries Summa Veg. Scandin. ii. 410, and Homom. 107; Sacc. Syll. i. 108.

A large genus chiefly found on twigs and branches of trees in temperate and warm temperate regions; rare in the tropics.

V. stellulata, Fries Summa Veg. Scandin. 411.

Socotra. On a tree stump upon Galonsir Plain. B.C.S. n. 1309.

Distrib. Europe, N. America, Cuba, Surinam.

5. OSTROPA.

Ostropa, Fries Pl. Homom. 109.

A small genus, with limited distribution in temperate regions.

O. cinerea, Fries Syst. Orb. Veg. 109.

Socotra. Growing on wood upon the hill slopes near Galonsir. B.C.S. n. 1306.

Distrib. Europe, N. Africa, U. States.

6. DOTHIDEA.

Dothidea, Fries (1818) Obs. Myc. ii. 347; Sacc. Syll. ii. p. 627.

A large genus in temperate and tropical regions, latterly subdivided into several smaller sub-genera according to the character of the sporidia.

D. (Dothidella) **Salvadoræ**, Cooke.

Amphigena, irregularis, prominula, atra, rugosa, hinc illic in circulos disposita, loculis albis. Ascis clavatis, octosporis. Sporidiis ellipticis, uniseptatis, utrinque rotundatis, hyalinis (·012–·014 × ·006 mm.).

Socotra. On leaves of *Salvadora Persica*. B.C.S. n. 334.
Distrib. Endemic.

DISCOMYCETES.

By Dr M. C. COOKE.

1. AILOPAPLUM.

Ailographum, Lib. Crypt. Ard. n. 272; Sacc. Syll. ii. 727.

A genus of about twenty species, chiefly found in temperate regions, only three or four having occurred in the tropics.

A. lirelliforme, Cooke.

Lineatum, minutum, sparsum. Peritheciis corneo-membranaceis, tenuibus (1 mm. long. ·2 mm. lat.) labiis arcte conniventibus, atris. Ascis saccatis (·08 × ·03 mm.) octosporis. Sporidiis ellipticis, uniseptatis, profunde constrictis, fuscis (·02 × ·01 mm.) paraphysibus superne brunneis.

Socotra. On dry wood. B.C.S. n. 1465.
Distrib. Endemic.

2. ASTERINA.

Asterina, Lev. in Ann. Sci. Nat. 1845, 59; Sacc. Syll. i. 39.

A genus consisting of about seventy species mostly tropical and subtropical.

A. dichænoides, Cooke.

Maculæformis (1 cm.) Peritheciis applanatis, membranaceis, atrofuscis, orbicularibus (·15 mm.) mox confluentibus, hyphis repentibus moniliformibus consociatis. Ascis subglobosis, ad basim apiculatis, octosporis. Sporidiis arcte ellipticis, uniseptatis, hyalinis (·01 × ·003 mm.)

Socotra. On living bark. B.C.S. n. 1366.
Distrib. Endemic.

With a strong resemblance to *Dichæna faginea* in habit and general appearance.

PHYCOMYCETES.

By Dr M. C. COOKE.

SPORIDESMIUM.

Sporidesmium, Link (1809) Berl. Mag. iii. p. 41.

About fifty species in temperate and subtropical countries.

S. maculans, Beitr. and Curt., Cuban Fungi, No. 578.

Socotra. On naked wood. B.C.S. nn. 1313, 1318.
Distrib. Cuba.

ALGÆ.

The late Dr G. Dickie kindly determined the species of Algæ we brought from Socotra which are enumerated here.

RHODOPHYCEÆ.

I. CERAMIACEÆ.

CERAMIUM.

Ceramium, Adans. Fam. ii. 13 (pro parte); Ktz. Tab. Phyc. xiii, tt. 4–16; J. G. Ag. Sp. Alg. ii. 113, and iii. 91.

A considerable genus with species in all seas.

C. tenuissimum, Syngb. Hydr. Dan. 120, t. 37, B. 4; J. G. Ag. Sp. Alg. ii. 120 and iii. 94.

C. nodosum, Griff. and Harv. in Harv. Phyc. Brit. t. 90.

Socotra.
Distrib. Atlantic Shores and Mediterranean; also Tasmania.

C. subtile, J. G. Ag. Sp. Alg. ii. 120 and iii. 94.

Socotra.
Distrib. Gulf of Mexico, Barbadoes.

II. LAURENCIACEÆ.

CHAMPIA.

Champia, Desv. in Ann. Mus. Par. xx. (1813), 139; Ktz. Tab. Phyc. xv. t. 84; J. G. Ag. Sp. Alg. ii. 368 and iii. 303.

A small genus of about ten species found on the shores of the Indian Ocean (Ceylon, Scindh, Persia, Mauritius, South Africa), the Phillippine Islands, Australia, and New Zealand, Sandwich Islands, and one species is reported from Florida.

C. compressa, Harv. Gen. South Afr. Pl. 402 and Ner. Austr. 78, t. 30; J. G. Ag. Sp. Alg. ii. 370 and iii. 305; Ktz. Tab. Phyc. xv. t. 84, f. 1.

Socotra.

DISTRIB. South Africa, Mauritius, Ceylon, Australia, and New Zealand.

III. GELIDIACEÆ.

HYPNEA.

Hypnea, Lamourx. in Ann. Mus. Par. xx (1813), 138; Ktz. Tab. Phyc. xviii. tt. 19–31; J. G. Ag. Sp. Alg. ii. 438 and iii. 560.

A genus containing many closely allied species, and chiefly found in the tropics and warmer regions of the southern hemisphere.

H. hamulosa, Montg. in Ann. Sc. Nat. sér. 3, xiii. (1849), 344; J. G. Ag. Sp. Alg. ii. 447 and iii. 563.

Fucus hamulosus, Turn. Hist. Fuc. t. 79.

Socotra.

DISTRIB. Red Sea, Indian Ocean (Rodriguez), Cape of Good Hope.

IV. CORALLINEÆ.

JANIA.

Jania, Lamourx. in Soc. Philom. N. Bull. iii. (1812), 181–188; J. G. Ag. Sp. Alg. ii. 553.

A cosmopolitan genus of about twenty species.

J. rubens, Lamourx. Hist. d. Polyp. Flex. 272; Harv. Phyc. Brit. t. 252.

Corallina rubens, Ell. and Soland. Zooph. 123; Ktz. Tab. Phyc. viii. t. 80, f. 1.

Socotra.

DISTRIB. The commonest species of the genus, and found on the European shores of the Atlantic, the shores of the Mediterranean, the Pacific and Indian Oceans. Probably it is also American.

PHÆOPHYCEÆ.

I. FUCACEÆ.

SARGASSUM.

Sargassum, Ag. Sp. Alg. 1, and Syst. Alg. xxxviii.; J. G. Ag. Sp. Alg. i. 268; Ktz. Tab. Phyc. xi

A large genus inhabiting warmer seas.

1. S. crispum, Ag. Syst. Alg. 297; J. G. Ag. Sp. Alg. t. 320; Ktz. Tab. Phyc. xi., t. 4, f. 1.

Fucus crispus, Forsk. Flor. Ægypt. Arab. 191.
Fucus latifolius, Delile Flor. Egypt. 147, t. 54, ff. 2, 2'.

Socotra.
DISTRIB. Red Sea.

2. S. asperifolium, Her. et Mart. ms. ex J. G. Ag. Sp. Alg. t. 334; Ktz. Tab. Phyc. xi., t. 10, f. 1.

S. linifolium, Ag. Sp. Alg. 19, var. *asperifolium*, Ag. *loc. cit.*
Fucus linifolius, Turn. Hist. Fucac. t. 168, var. *asperifolius*, Turn.

Socotra.
DISTRIB. Red Sea.

II. DICTYOTEÆ.

1. PADINA.

Padina, Adans. Fam. ii. 13; J. G. Ag. Sp. Alg. t. 112.

A small genus represented chiefly in warmer seas.

P. pavonia, Adans. Fam. ii. 13 and 586; Harv. Phyc. Brit. 91; J. G. Ag. Sp. Alg. t. 113.

Socotra.
DISTRIB. Subtropical and tropical Seas.

2. DICTYOTA.

Dictyota, Lamourx. in Ann. Mus. Par. xx. (1813), 271 *pro parte*; J. G. Ag. Sp. Alg. i. 86; Ktz. Tab. Phyc. ix.

A genus of several variable species found in all seas.

1. **D. dichotoma**, Lamourx. in Ann. Mus. Par. xx. (1813), 273; Harv. Phyc. Brit. t. 103; Ktz. Tab. Phyc. ix., t. 10, f. 1.

Socotra.

DISTRIB. Round the whole world in warmer regions.

var. **intricata**, Grev. Alg. Brit. 58.

D. implexa, Lamourx. *loc. cit.* 273; Ktz. Tab. Phyc. ix., t. 14, f. 1; Delile Flor. Egypt. 147, t. 56, f. 2.

D. dichotoma, var. *implexa*, J. G. Ag. Sp. Alg. i. 92.

Socotra.

DISTRIB. Mediterranean and Red Seas, Atlantic and Pacific Oceans.

2. **D. acuminata**, Ktz. Sp. Alg. 555, and Tab. Phyc. ix. 7, t. 15, f. 3.

Socotra.

DISTRIB. Red Sea, Ceylon.

3. ASPEROCOCCUS.

Asperococcus, Lamourx. in Ann. Mus. Par. xx. (1813), 277; J. G. Ag. Sp. Alg. i. 74.

A small genus including a dozen or more species widely dispersed over the globe.

1. **A. sinuosus**, Bory. Exp. Morée iii. 326; J. G. Ag. Sp. Alg. i. 75.

Encœlium sinuosum, Ag. Syst. Alg. 262; Ktz. Tab. Phyc. ix. t. 8, f. 1.

Socotra.

DISTRIB. Warmer regions all round the world.

2. **A. intricatus**, J. G. Ag. Alg. Liebm. 7, ex eod. Sp. Alg. i. 77.

Socotra.

DISTRIB. Vera Cruz, Fernando Noronha, Mauritius.

4. HYDROCLATHRUS.

Hydroclathrus, Bory in Dict. Class. viii. (1825), 419; Ktz. Tab. Phyc. ix.

A monotypic genus of tropical and subtropical seas.

H. cancellatus, Bory *loc. cit.*; Ktz. Tab. Phyc. ix. t. 52, f. 2.

Asperococcus clathratus, Bory ms. eg J. G. Ag. Sp. Alg. i. 75.

Socotra.

DISTRIB. Of the genus.

CHLOROPHYCEÆ.

1. ZYGNEMACEÆ.

1. SPIROGYRA.

Spirogyra, Link Handb. iii. 262; Ktz. Sp. Alg. 437, and Tab. Phyc. v.; Rabenh. Alg. Europ. iii. 232, f. 73.

A large genus of fresh water forms distributed all over the world.

1. **S. turpis**, Ktz. Sp. Alg. 438, and Tab. Phyc. v. 6, t. 19. f. 2.

Zygnema malformatum, Hass. Alg. 147, t. 30, ff. 1, 2.

Socotra.

DISTRIB. Britain.

2. **S. condensata**, Ktz. Phyc. Gen. 279, and Sp. Alg. 440, and Tab. Phyc. v. 7, t. 22, f. 3; Rabenh. Alg. Europ. ii. 241.

Conjugata condensata, Vauch. Conf. 67, t. 5, f. 2.

Socotra.

DISTRIB. Europe generally.

3. **S. decimina**, Link Handb. 262; Ktz. Phyc. Gen. 279, t. 14, f. 2, and Sp. Alg. 441, and Tab. Phyc. v. 7, t. 23, f. 3, and t. 24, f. 1; Rabenh. Alg. Europ. ii. 242.

Socotra.

DISTRIB. Europe, Asia, and America.

4. **S. dubia,** Ktz. Sp. Alg. 441; Tab. Phyc. v. 8, t. 24, f. 4; Rabenh. Alg. Europ. ii. 243,

var. **longiarticulata,** Ktz. Tab. Phyc. v. 8, t. 25, f. 1.

Socotra.

DISTRIB. Many parts of Europe.

2. ZYGNEMA.

Zygnema, Ag. Syst. Alg. 77; Ktz. Phyc. Gen. 280, and Sp. Alg. 444, and Tab. Phyc. v.; Rabenh. Alg. Europ. iii. 249, f. 74.

A considerable genus represented in all parts of the world.

Z. Vaucherii, Ag. Syst. Alg. 77; Ktz. Phyc. Gen. 280, and Sp. Alg. 445, and Tab. Phyc. v. 5, t. 16, f. 4; Rabenh. Alg. Europ. iii. 250,

var. **tenue,** Rabenh. Alg. Europ. ii. 250.

Z. tenue, Ktz. Sp. Alg. 446, and Tab. Phyc. v. 5, t. 16, f. 3.

Socotra.

DISTRIB. Of the species—Europe in many places. Of the variety—Europe, Bolivia.

2. CONFERVOIDEÆ.

CHÆTOMORPHA.

Chætomorpha, Ktz. Phyc. Germ. 203, and Sp. Alg. 375, and Tab. Phyc. iii.; Rabenh. Alg. Europ. ii. 327, f. 293.

A large genus of marine and brackish water, species found all over the world.

1. **C. tortuosa,** Ktz. Sp. Alg. 376, and Tab. Phyc. iii. 17, t. 50, f. 2.

Conferva tortuosa, Dillwyn. Conf. 46; Eng. Bot. t. 2220.

Socotra.

DISTRIB. Mediterranean and Adriatic, Atlantic shores of Europe, United States, Juan Fernandez, Barbadoes.

2. **C. chlorotica,** Ktz. Sp. Alg. 377; Tab. Phyc. iii. 18, t. 54, f. 2.

Socotra.

DISTRIB. Mediterranean and Adriatic.

3. ULVACEÆ.

ULVA.

Ulva, Linn. Gen. n. 1206; Ag. Sp. Alg. 401, pro parte; Ktz. Tab. Phyc. vi.; Rabenh. Alg. Europ. iii. 316.

A genus of several species and represented in all seas.

U. latissima, Linn. Fl. Suec. 433; Harv. Phyc. Brit. t. 171; Ktz. Tab. Phyc.; Rabenh. Alg. Europ.

Socotra.

DISTRIB. Cosmopolitan.

4. CHÆTOPHORACEÆ.

MICROTHAMNION.

Microthamnion, Näg. in Ktz. Sp. Alg. 352, and Tab. Phyc. iii. t. 1, f. 1, and t. 55, f. 1; Rabenh. Alg. Europ. ii. 375, f. 106.

A small genus, including both marine and fresh water forms, found in Europe, at the Cape, St Helena, and Kerguelen Island.

M. breviarticulatum, G. Dickie in Proc. Roy. Soc. Edin. xi. (1882), 456.

Ramulis alternis, articulis diametro aqualibus vel duplo-longioribus, diam. ·0002 unc.

Socotra.

DISTRIB. Endemic.

SCHIZOPHYTA.

The late Dr G. Dickie kindly determined the species of Schizophyta we brought from Socotra which are enumerated here.

CYANOPHYCEÆ.

1. NOSTOCACEÆ.

NOSTOC.

Nostoc, Vauch. Conf. 203, t. 16; Ktz. Sp. Alg. 295, and Tab. Phyc. ii.; Rabenh. Alg. Europ. ii. 162, f. 35.

A large genus, several of the species having a wide distribution.

1. N. aureum, Ktz. Tab. Phyc. ii. 1, t. 1, f. 4; Rabenh. Alg. Europ. ii. 165.

Socotra.

DISTRIB. Reported from Holland and Scandinavia.

2. **N. verrucosum,** Vauch. Conf. 225, t. 16, f. 3; Ktz. Sp. Alg. 300, and Tab. Phyc. ii. 3, t. 9, f. 2; Rabenh. Alg. Europ. iii. 176.

Socotra.

DISTRIB. Cosmopolitan.

2. RIVULARIEÆ.

SCHIZOSIPHON.

Schizosiphon, Ktz. Phyc. Gen. 233, and Sp. Alg. 327, and Tab. Phyc. ii.; Rabenh. Alg. Europ. ii. 232, f. 55.

A considerable genus of marine and fresh water forms distributed in both old and new worlds.

S. aponinus, Menegh. in Ktz. Sp. Alg. 328, and Tab. Phyc. ii. 15, t. 49, f. 3; Rabenh. Alg. Europ. ii. 235.

Socotra.

DISTRIB. Italy.

3. OSCILLARIEÆ.

1. LYNGBYA.

Lyngbya, Ag. Syst. Alg. xxv. and 73; Ktz. Sp. Alg. 279, and Tab. Phyc. i.; Rabenh. Alg. Europ. ii. 135, f. 27.

A vast genus of all parts of the world in both fresh and salt waters.

1. L. obscura, Ktz. Phyc. Gen. 224, t. 5, f. 1, and Sp. Alg. and Tab. Phyc. i. 48, t. 88, f. 2; Rabenh. Alg. Europ. ii. 136, f. 27, 2.

Socotra.

DISTRIB. Generally in Europe.

2. L. curvata, Rabenh. Alg. Europ. ii. 137.

Siphoderma curvatum, Ktz. Phyc. Gen. 220, and Sp. Alg. 274, and Tab. Phyc. i. 45, t. 78, f. 2.

Socotra.

DISTRIB. Italy, North Germany.

3. L. majuscula, Harv. in Hook. Brit. Flor. ii. (1833), 370, and Phyc. Brit. t. 62; Ktz. Tab. Phyc. i. 49, t. 90, f. 1.

Socotra.

DISTRIB. Cosmopolitan.

4. **L. scabrosa**, G. Dickie, in Proc. Roy. Soc. Edin. xi. (1882).

Cæspitosa, viridi-nigrescens, trichomatibus flexuosis ærugineo-cœruleis, articulis diametro duplo-brevioribus, vaginis scabrosis, achrois, diam. ·001 unc.

Socotra.

DISTRIB. Endemic.

2. OSCILLARIA.

Oscillaria, Bory in Dict. Class. i. (1822), 594, and xii. (1827), 457; Ktz. Tab. Phyc. i.; Rabenh. Alg. Europ. ii. 95, f. 24.

A vast genus of wide distribution.

1. **O. Frölichii**, Ktz. Phyc. Gen. 189, and Tab. Phyc. i. 31, t. 43, f. 1; Rabenh. Alg. Europ. ii. 109.

Socotra.

DISTRIB. Europe generally.

A variety of this somewhat protean type occurs on Socotra.

2. **O. anguina**, Bory in Dict. Class. xii. (1827), 467; Ktz. Tab. Phyc. i. 28, t. 40, f. 7; Rabenh. Alg. Europ. ii. 108.

Socotra.

DISTRIB. Europe generally.

SCHIZOMYCETES.

1. HYPHEOTHRIX.

Hypheothrix, Ktz. Phyc. Gen. 229, and Tab. Phyc. i.; Rabenh. Alg. Europ. ii. 75, t. 21.

A considerable genus reported from many parts of Europe and from Ceylon.

H. **vulpina**, Ktz. Sp. Alg. 267, and Tab. Phyc. i. 41, t. 67, f. 2; Rabenh. Alg. Europ. ii. 86.

Socotra.

DISTRIB. Switzerland, Saxony, Silesia.

2. BEGGIATOA.

Beggiatoa, Trev. Flor. Engan. 56; Rabenh. Alg. Europ. ii. 94, f. 23.

A small genus recorded from Europe generally.

B. **alba**, Trev. Flor. Engan. 57; Rabenh. Alg. Europ. ii. 94.

Oscillaria alba, Vauch. Conferv. 198, t. 15, f. 11; Ktz. Tab. Phyc. i. 16, t. 38, f. 3.

Socotra.

DISTRIB. Reported from many parts of Europe.

DIATOMACEÆ.

By FRED. KITTON, Hon. F.R.M.S., &c.

The washings of some aquatic plants from Socotra were placed in my hands by the late Lieut.-Col. H. H. Godwin Austen, F.R.S., for the purpose of identifying the diatoms contained in it, and the result of the examination is published in the *Journal of the Linnean Society, Botany*, vol. xx. 1884, pl. 48.

After eliminating the vegetable matter and coarse sand, the diatomaceous remains were small in quantity; the words "rare," "not uncommon," &c., must therefore be considered as referring to the materials at my disposal rather than to the abundance or scarcity of the species on the island.

Tribe 1. Raphidieæ.

Family 1. CYMBELLÆ.

1. AMPHORA.

Amphora, Ehr. 1831.

A. ovalis, Ehr. Monatsb. Berlin 1840; Kütz. Bacill. 1844, 107, t. 5, f. 25; Smith Synops, i. 19, t. 2, f. 26; H. L. Smith, "Lens." ii. 80, t. 11, f. 17; Schmidt Atlas d. Diatom. 26, f. 106; Van Heurck Synops. 59, t. 1, f. 1; Kitton in Journ. Lin. Soc. xx. 515.

Socotra. Frequent.

Distrib. A widely distributed species, occurring in fresh and brackish water.

2. CYMBELLA.

Cymbella, Agh. 1839.

1. C. lanceolatum, Ehr.

Cocconema lanceolatum, Ehr. Infus. t. 19, f. 6; Kütz. Bacill. 81, t. 6, f. 3; Dujardin Infus. 4 Hass. Alg. t. 101, f. 1; Smith Synops. i. 75, t. 23, f. 219; Schmidt Atlas d. Diatom. t. 10, ff. 8–10; Kitton in Journ. Linn. Soc. xx. 515.

Socotra.

Distrib. A widely distributed species.

2. C. bengalensis, Grunow; Schmidt Atlas d. Diatom. t. 9, f. 13; Kitton in Journ. Linn. Soc. xx. 515, t. 48, f. 6.

Socotra. Not common.
DISTRIB. Whatebevot, Khayenmâthy.

3. C. cistula, Ehr.; Hemp.; Van Heurck. Synops. 64, t. 2, ff. 12, 13.

Bacillaria cistula, Ehr.
Gomphonema semiellipticum, Agh. Conspect.
G. simplex, Kütz. Synops. 37, t. 4, f. 23.
Cocconema cistula, Kütz. Bacill. 80, t. 6, f. 1; Smith Synops. i. 76, t. 23, f. 221; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Frequent.
DISTRIB. Common everywhere.

4. C. cymbiformis, Ehr.

Frustulia cymbiformis, Kütz. Synops. t. 1, f. 19.
F. coffeæformis, Kütz. Alg. Dec. ii. No. 11.
Cymbophora fulva, De Brébisson.
Cocconema cymbiforme, Ehr. Infus. t. 19, f. 8; Smith Synops. i. 76, t. 23, f. 220; Schmidt Atlas d. Diatom. t. 10, f. 13; Van Heurck Synops. 63, t. 2, f. 11; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Frequent.
DISTRIB. A common and widely distributed species.

Family 2. NAVICULEÆ.

1. NAVICULA.

Navicula, Bory, 1822.

1. N. sphærophora, Kütz. Dec. No. 84; id. Bacill. 95, t. 4; f. 17; Smith Synops. i. 56, t. 17, f. 156; Schmidt Atlas d. Diatom. t. 49, ff. 49–51; Van Heurck Synops. 101, t. 12, ff. 2–3; Kitton in Journ. Linn. Soc. xx. 515.

Anomœoneis sphærophora, Pfitzer. Bau. u. Entwickl. d. Bacill. 77, t. 3, f. 10.

Socotra. Rare.
DISTRIB. More or less frequent in fresh water everywhere.

2. N. elliptica, Kütz. Bacill. 98, t. 30, f. 55.

N. ovalis, Smith Synops. i. 48, t. 17, f. 55; Pritchard Infus. 1861, 399; Schmidt Atlas d. Diatom. t. 7, ff. 27–32; Van Heurek Synops. 92, t. 10, f. 10; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Rare.

DISTRIB. A widely distributed fresh and brackish water species.

3. N. mutica, Kütz., var. Cohnii, Hilse.

Stauroneis Cohnii, Hilse in Ber. d. Schlesisch-Gesellsch. 1860; Van Heurck Synops. t. 10, f. 17.

Socotra. Very rare. Detected by Dr Bossey.

DISTRIB. I have found this species in washings of *Sphagnum*, and in the green slime produced by the leakage of cisterns, &c. Europe, North and South America, India.

2. MASTOGLOIA.

Mastogloia, Thwaites, 1848.

1. M. Dansei, Thwaites; Smith Synops. ii. 44, t. 62, f. 388; Pritchard Infus. 924, t. 15, f. 30; Van Heurck Synops 92, t. 10, f. 12; Kitton in Journ. Linn. Soc. xx. 515.

Dickieia Dansei, Thwaites in Ann. Mag. Nat. Hist. sec. 2, i. t. 22, f. k.

Socotra.

DISTRIB. A common brackish and fresh water species.

2. M. lanceolata, Thwaites; Smith Synops. ii. 64, t. 54, f. 340; Pritchard Infus. 924; Van Heurck Synops. 70, t. 4, ff. 15, 16, 17.

Navicula Meleagris, Kütz. Bacill. 92, t. 30, f. 37?

Socotra. Not frequent.

DISTRIB. A common brackish water species, less frequent in fresh water.

3. M. elliptica, Agh.

M. elliptica (*Dansei* var.?) Van Heurck Synops. pl. iv. f. 19; Journ. Linn. Soc. xx. 515.
Frustulia elliptica, Agardh.
Amphora? elliptica, Kütz.

Socotra. Rare.

DISTRIB. Baltic, Trieste, Breydon, and Flordon (Norfolk). In the last named habitat the water is perfectly fresh, the other localities are salt and brackish water.

3. STAURONEIS.

Stauroneis, Ehr. 1843.

S. anceps, Ehr.

var. **amphicephala**, Van Heurck Synops. 69, t. 4, ff. 6, 7.

S. amphicephala, Kütz. Bacill. 119, t. 3, f. 25.

Socotra. Rare.

DISTRIB. A widely distributed fresh water species.

Family 3. GOMPHONEMEÆ.

GOMPHONEMA.

Gomphonema, Agh. 1824.

1. G. intricatum, Kütz. Bacill. 87, t. 9, f. 4; Smith Synops. i. 8, t. 29, f. 241; Van Heurck Synops. 126, t. 29, several figures; I am now disposed to think that the differences are too slight to constitute a variety.

G. intricatum, var., Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Not rare.

DISTRIB. Common in fresh water, and in many of the European and American sub-peat deposits.

2. G. affine, Kütz. Bacill. 86, t. 30, f. 54; Pritchard Infus. 896; Rabenhorst Süsswasser Diat. 59, t. 2, f. 11; Van Heurck Synops. t. 24, ff. 8, 9; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Not uncommon.

DISTRIB. Island of Trinidad, Norfolk, frequent in fresh water.

3. G. acuminatum, Ehr.

var. **coronata**, Van Heurck Synops. 124, t. 23, f. 15; Kitton in Journ. Linn. Soc. xx. 515.

G. coronatum, Ehr.; Kütz. Bacill. 87, t. 21, f. 12.
G. acuminatum, var. β; Smith Synops. i. 79, t. 27, f. 238 β.

Socotra. Frequent, mixed with the type form.

DISTRIB. Common everywhere.

4. G. Turris, Ehr. Amer. 128; Id. Mikrog. many figures; Kütz. Bacill. 87; Pritchard Infus. 889; Van Heurck Synops, t. 23, f. 5; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Not common.
DISTRIB. A widely distributed species.

5. G. constrictum, Ehr.

var. subcapitata, Van Heurck Synops. pl. xxiii. fig. 23; Kitton Journ. Linn. Soc. xx. p. 515.

Socotra. Rare.
DISTRIB. I have found this species mixed with the type form in gatherings from America, Java, and West Indies.

Family 4. ACHNANTHEÆ.

ACHNANTHES.

Achnanthes, Bory, 1822.

A. linearis (Wm. Smith), Grunow, Cleve and Grunow, Beitr. z. Kennt. d. Arctischen Diatom. 23; Van Heurck Synops. 131, t. 28, ff. 31, 32; Kitton in Journ. Linn. Soc. xx. 515.

Achnanthidium lineare, Wm. Smith Synops. ii. 31, t. 61, f. 381.
A. Jackii, Rabenh. Flor. Europ. Ag. sec. i. 106.

Socotra. Frequent.
DISTRIB. One of the commonest of fresh water diatoms.

Family 5. COCCONEIDEÆ.

COCCONEIS.

Cocconeis, Ehr. 1835.

C. pediculus, Ehr. Infus. t. xxi. f. 2; Smith Synops. i. 21, t. 3, f. 31; Van Heurck Synops. 130, t. 32, ff. 11, 13; Kitton in Journ. Linn. Soc. xx. 515.

Frustulia Lens, De Brebisson.

Socotra. Frequent.
DISTRIB. Common everywhere.

Tribe 2. PSEUDORAPHIDEÆ.

Family. FRAGILARIEÆ.

1. EPITHEMIA.

Epithemia, De Brébisson, 1838.

E. gibberula, Ehr.

var. **producta**, Van Heurck Synops. 130, t. 32, ff. 11–13; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Frequent.

DISTRIB. Common everywhere.

2. EUNOTIA.

Eunotia, Ehr. 1837.

E. pectinalis, Ehr. (Müller); Van Heurck Synops. 142, t. 33, ff. 15, 16.

Conferva pectinalis, Dillid. Brit. Conferv. 1809.
C. bronchialis, Roth. Cat. Bot. i. 186.
Eunotia depressa, Ehr. Verb.
Fragilaria pectinalis, Relfs. Ann. Mag. Nat. Hist. xii. 107.
Himantidium pectinale, Kütz. Bacill. 39; Smith Synops. ii. 12, t. 32, f. 284.

Socotra. Frequent.

DISTRIB. A widely distributed species.

3. FRAGILARIA.

Fragilaria, Lyngbye, 1819.

F. Ungeriana, Grunow 1863; Kitton in Journ. Linn. Soc. xx. 514, t. 48, f. 4.

Frustules narrow, linear, with distinct marginal puncta, coherent forming long filaments, valves linear constricted near the rounded apices, striate, the striæ becoming indistinct as they approach the centre. Length ·0090″ to ·0166″, breadth ·0003.

Socotra. Common.

DISTRIB. Cyprus, Belgium.

This form was found by A. Grunow in a gathering made by Dr Unger in the Island of Cyprus, and subsequently described by Herr Grunow in Verhand. der. k. k. Zool. Bot. Gesell. Bd. xiii. 1863. Col. Mason more recently found it growing in abundance in Belgium; in a dry state the filaments have a beautiful silvery green lustre; single frustules very closely resemble *Synedra ulna*.

Tribe 3. CRYPTORAPHIDEÆ.

Family 1. BIDDULPHIEÆ.

1. TERPSINOË.

Terpsinoë, Ehr.

T. musica, Ehr. Amer. 1843; Kütz. Bacill. 128, t. 30; id. Sp. Alg. 119; Pritchard Infus. 859, t. 11, f. 47.

Socotra. Not uncommon.

DISTRIB. Vera Cruz, Jamaica, Caraccas, abundant in thermal springs; Mauritius, parasitic on barnacles living on a ship's bottom.

2. CERATAULUS.

Cerataulus, Ehr.

C. socotrensis, Kitton in Journ. Linn. Soc. xx. 514, t. 48, f. 1.

Frustulo ventro adspecta cylindrico cingulo dense punctato valvulis circularibus vel late ellipticis leviter bullato infra 2–4 processas marginales; striis delicatis prope marginem radiatim per reliquum superficies valvuli compacte sed irregulariter dispositis; setæ 3 vel pluræ in medio setæ. Diametro ·0023 to ·0028 pollie.

Frustule in front view cylindrical, cingulum very finely punctate; valves circular or broadly elliptical, slightly bullate below the marginal processes, which vary from two to four in number, striæ delicate, radiating near the margin, closely but irregularly disposed on the remainder of the valve; three or more short setæ occur midway between the centre and circumference. Diameter ·0023 to ·0028 of an inch.

Socotra.

DISTRIB. Java.

Since I described this species I have (*loc. cit.*) found it in a gathering made by M. Julien Deby in a running stream on the slope of the volcanoes of Pangeroon and Jedeh, Java, at an elevation of between 4000 and 5000 ft.; the majority of valves have three processes, on those with two only they are frequently not opposite to each other. Grunow, in his paper on New Diatoms from Honduras, Monthly Mic. Journ. 1857, p. 165, pl. cxvi., described and figured a Cerataulus much resembling the above as a var. of *C. lævis* (*C. lævis* var.? *chinensis*), but his figure (3 *e*) representing the striæ × 1540 diameters do not agree with those on *C. socotrensis* under a similar magnification.

Family 2. COSCINODISCEÆ.

CYCLOTELLA.

Cyclotella, Kütz., 1833.

C. Meneghiniana, Kütz.

var. **rectangulata**, Brébisson, Van Heurck Synops. p. 214, pl. xciv. fig. 17 ; Kitton in Journ. Linn. Soc. xx. 515.

Socotra. Rare.

Distrib. England, France, Europe, America, Asia, found in fresh and brackish water.

INDEX.

[Names in CAPITALS refer to natural orders, tribes, &c.; those in SMALL CAPITALS to genera; those in roman type to the chief reference to the species included in the work; those in *italics* to orders, genera, or species incidentally mentioned, synonyms, &c.]

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APPENDIX AND CORRECTIONS.

Page 3, line 6 from top. An account of the anatomy is deferred.
„ 7, line 19 from bottom, *for* xiii. *read* xii.
„ 7, „ 18 „ „ *for* (1883). *read* (1884), 402.
„ 10, „ 16 „ top, *for* xiii. (1883). *read* xii (1884), 402.
„ 11, „ 7 „ „ *for* xiii. (1883). *read* xii (1884), 402.
„ 11, „ 12 „ „ *for* Eschäb. 'Eschab. *read* Eschäb or 'Eschab (Schweinf.).
„ 17, „ 13 „ „ *for* xiii. (1883). *read* xii (1884), 402.
„ 20, „ 21 „ „ *for* xiii. (1883). *read* xii (1884), 403.
„ 23, „ 10 „ „ *for* xiii. (1883). *read* xii (1884), 403.
„ 35, „ 3 „ „ *for* Boheng. *read* Boheng (Schweinf.).
„ 36, „ 10 „ „ *for* Petala, *read Petala.*
„ 40, „ 13 „ bottom, *for* NOM VERN. *read* NOM. VERN.
„ 43, „ 8 „ „ *for* xiii. (1883). *read* xii (1884), 403.
„ 45, „ 2 „ top, *for* xiii. (1883). *read* xii (1884), 403.
„ 49, as first line *insert* NOM. VERN. Tenage (Schweinf.).
„ 49, line 2 from top, *after* n. 603 *insert* Schweinf.
„ 49, „ 3 „ bottom, *delete* Hab.
„ 50, line 16 from top. An account of the anatomy is deferred.

Professor Dobbie of Bangor, and Dr G. G. Henderson of Glasgow University, have kindly analysed 'ameero,' and supply the following account of its constitution:—

"'Ameero' forms drops agglomerated to a sticky brown-coloured plastic mass. It can be easily separated into two portions by the action of water, alcohol, or ether, in all of which it is only partially soluble.

"Its percentage composition, after separating out the impurities (vegetable tissue, sand, &c.), is approximately

Portion soluble in ether, ...	77
Portion insoluble in ether, . . .	20
Volatile oil soluble in ether, . . .	3
	100

"The portion soluble in ether is a hard, brittle, transparent yellow resin, insoluble in water and petroleum-ether, but soluble in alcohol, carbon bisulphide, chloroform, and benzene. It is not acted upon by caustic soda. With lead acetate its alcoholic solution gives a white precipitate. Two combustions gave the following numbers:—

	1.	2.
C	78·10	77·85
H	10·61	10·61
O	11·29	11·54
	100·00	100·00

"The portion insoluble in ether dissolves in water, and, when evaporated to dryness forms a hard, brittle, transparent, brown-coloured film. The aqueous solution has an acid reaction, and gives with lead acetate a white precipitate, which does not dissolve on boiling. This portion is either identical with, or very closely allied to, gum-arabic.

"'Ameero' is therefore a gum-resin, and appears to be identical with the 'olibanum' derived from various species of *Boswellia*. Our analyses of the resinous portion agree fairly well with those of Johnstone (Watt's Dict., art. 'Olibanum'), the discrepancy being probably due to our not having, before burning, purified with sufficient care, the quantity at our disposal being somewhat limited."

Page 55, line 8 from top. An account of the anatomy of this Balsamodendron is not given here, for the same reasons as are stated under note to page 49.

Professor Dobbie and Dr G. G. Henderson have been so kind as to analyse the gum-resin, and they report—

"'Lögahan' occurs in small, brittle, colourless, or light brown-coloured drops or tears, which have a slight terebinthinous smell and taste. It is insoluble in water, soluble in ether, chloroform, benzene, and carbon bisulphide, and partially soluble in petroleum-ether, and alcohol. By the action of the last solvent it can be split up into two distinct resins. The percentage composition of 'lögahan' is approximately

Portion insoluble in alcohol, . . .	32·0
Portion soluble in alcohol, . . .	65·0
Volatile oil soluble in ether, . . .	1·5
Impurity insoluble in ether, . . .	1·5
	100·00

"The portion soluble in alcohol is a hard, brittle, yellow, transparent resin, with a pleasant aromatic odour. It is insoluble in water and petroleum ether, but soluble in ether, benzene, chloroform, and carbon bisulphide. Three analyses gave the following results:—

	1.	2.	3.
C	76·44	75·14	77·30
H	10·12	9·91	10·14
O	13·44	14·95	12·56
	100·00	100·00	100·00

"The portion insoluble in alcohol is a white resin, which melts and boils at a low temperature, solidifying on cooling to a hard, brittle, transparent mass, insoluble in water, and soluble in ether, carbon, bisulphide, benzene, chloroform, and petroleum-ether. Two combustions gave the following numbers:—

	1.	2.
C	81·97	81·86
H	10·43	10·39
O	7·60	7·75
	100·00	100·00

"'Lögahan' does not at all correspond in characters with the exudation from other species of *Balsamodendron*, but is very singular in properties, and perhaps identical with 'Lubân Meyeti,' or 'Lubân Matti,' a variety of 'Elemi,' obtained from *Boswellia Frereana* (Flückiger and Hanbury, Pharmacographia, Ed. 1874, p. 135)." There can be little doubt that this gum-resin which we obtained from the inhabitants under the name of lögahan, and as a sample of the produce of *Balsamodendron socotranum*, must be the product of one of the species of *Boswellia* on the island, and not of the *Balsamodendron* from which it was said to come. I have thought it well, however, to record the analysis.

Page 63, last line, after 504 *insert* Hunter.

„ 72, line 3 from bottom, *for* i., *read* ii.

„ 77, „ 17 „ top, *for* xiii. (1883). *read* xii (1884), 404.

„ 78, „ 9 „ bottom, *after* Asia, *insert* and Nubia.

„ 88, „ 14 „ „ Professor Dobbie of Bangor and Dr G. G. Henderson have been so kind as to examine this gum, and gave the following report:—

"'Sumach' forms large transparent, colourless, or light amber-coloured tears, which are brittle, break with a conchoidal fracture, and can be easily cut with a knife. It is soluble in water, and insoluble in alcohol and ether. It is undoubtedly identical with 'gum-arabic,' obtained from other species of *Acacia*."

Page 88, line 13 from bottom, *for* xiii. (1883). *read* xii (1884), 404.

„ 96, „ 11 „ „ The further account of the anatomy is deferred.

„ 97, line 20 from top, *for* xiii. (1883). *read* xii (1884), 404.

„ 101, „ 8 „ „ The specimens I hoped to obtain have not been secured, and further information about this interesting plant cannot therefore be given.

Page 103, line 11 from top, M. Duchartre has published an account of the structure of the bulblets of this *Begonia* in Bulletin de la Société botanique de France, xii. (1885).

Page 103, line 17 from bottom, *for* xiii. (1883). *read* xii (1884), 404.

„ 111, „ 11 „ „ *for* xiii. (1883). *read* xii (1884), 405.

„ 111, „ 3 „ „ *for* asa, *read* as a.

„ 112, „ 14 „ „ *for* virigata, *read* virgata.

„ 113, top line, *for* xiii. (1883). *read* xii (1884), 405.

„ 113, line 14 from top, *for* xiii. (1883). *read* xii (1884), 405.

„ 114, top line, *for* xiii. (1883). *read* xii (1884), 405.

„ 123, line 4 from bottom, *after* Abyssinia *add* also Kilima Njaro. Mr H. H. Johnston has brought this plant from Kilima Njaro.

Page 132, line 24 from top, *for* panduriforima, *read* panduriformia.

„ 133, „ 15 „ bottom, *for* xiii. (1883). *read* xii (1884), 405.

„ 133, „ 8 „ „ *for* xiii. (1883). *read* xii (1884), 405.

„ 134, „ 3 „ top, *for* xiii. (1883). *read* xii (1884), 406.

„ 134, „ 20 „ „ *for* eastern, *read* western.

„ 141, „ 13 „ bottom, *for* xiii. (1883). *read* xii (1884), 406.

„ 150, „ 4 „ top, *for* xiii. (1883). *read* xii (1884), 406.

„ 153, „ 13 „ „ *for* xiii. (1883). *read* xii (1884), 406.

„ 154, top line, „ „ *for* xiii. (1883). *read* xii (1884), 406.

Page 165, line 17 from bottom. Material has failed me, and I am not therefore able to add anything of value to what is already stated in the text.

Page 186, lines 18 and 17 from bottom, Cystistemon was printed in Proc. Roy. Soc. Edin. Cystostemon.

Page 187, line 13 from top, C. socotranus was printed in Proc. Roy. Soc. Edin. C. socotranum.

Page 191, line 12 from top, *for* north-west, *read* north-east.

„ 210, top line, *for* xiii. (1883). *read* xii (1884), 407.

„ 210, line 10 from top, *for* xiii. (1883), *read* xii (1884), 407.

„ 215, „ 14 „ „ *for* N. ACULEATUS, *read* 1. N. ACULEATUS.

„ 222, line 16 from bottom, *for* T. ORBICULATUS, *read* 2. T. ORBICULATUS.

„ 223, „ 3 „ „ *for* two, *read* three; and *after* Arabia, *insert* "another east tropical Africa;" and *for* other, *read* third. This alteration is necessary on account of the discovery of a species in east tropical Africa by Mr H. H. Johnston (see 'The Kilima Njaro Expedition,' p. 337).

Page 223, line 13 from top, *delete* 2.

„ 224, „ 5 „ „ *for* xiii. (1883). *read* xii (1884), 407.

„ 224, lines 8 and 7 from bottom, Ancalanthus was printed in Proc. Roy. Soc. Edin. Angkalanthus.

Page 233, lines 13 and 12 from bottom, Cœlocarpus was printed in Proc. Roy. Soc. Edin. Cœlocarpum.

Page 235, line 2 from top, C. socotranus was printed in Proc. Roy. Soc. Edin. C. socotranum.

„ 247, top line, *for* xiii. (1883). *read* xii (1884), 407.

„ 247, line 16 from bottom, *for* xiii. (1883). *read* xii (1884), 407.

„ 251, „ 6 „ top, *for* xiii. (1883). *read* xii (1884), 408.

„ 251, „ 3 „ bottom, *for* xiii. (1883). *read* xii (1884), 409.

„ 256, „ 11 „ top, *for* xiii. (1883). *read* xii (1884), 410.

„ 265, „ 12 „ „ *for* xiii. *read* xii

„ 265, „ 13 „ „ *for* (1883). *read* (1884), 410.

„ 267, top line, *for* xiii. *read* xii

„ 267, line 2 from top, *for* (1883). *read* (1884), 410.

„ 269, „ 5 „ „ *for* xiii. (1883). *read* xii (1884), 410.

„ 269, „ 10 „ „ *for* xiii. (1883). *read* xii (1884), 410.

„ 271, „ 14 „ „ *for* xiii. (1883). *read* xii (1884), 411.

„ 281, „ 18 „ „ I had hoped to give an account of the structure of this plant, but as there are only two small plants living in this country, it has not been possible to get material for a complete examination, and an account of it is therefore deferred.

Page 281, line 19 from top, *for* 5, *read* 2.

„ 292, line 12 from top, *for* 107, *read* 197. I have given sufficient account in the Introductory Chapter of the mode of collecting aloes. We brought to this country a considerable quantity in a fluid condition, which, after being kept in stoppered bottle for a short time, deposited a dense yellow sediment. I have not received an analytical account of the aloes we brought.

The origin of the designation 'Socotrine,' 'Soccotrine,' or 'Succotrine,' given to the aloes is an interesting question. Three derivations have been suggested. There is the evident one from the name of the island. Then there is one which sees in it the words 'succus citrinus.' Lastly, there is one recently suggested by Mr Mowat in 'Alphita,' p. 67. He connects it with the Greek συκωτόν = Lat. ficatus = It. fegato, and Fr. foie. This word 'originally seems to have denoted the liver of a goose fattened on figs,' and the word soccotrinum or succotrinum applied to the aloes would therefore be the equivalent of epaticum.

Page 293, top line, *after* 623 *insert* TAB. XCVI., XCVII.

„ 294, line 19 from top. Of this tree, as of several others, the anatomical account is deferred. In Tab. XCVI. the round scars on the trees, whence the dragon's blood is cut, are indicated.

Page 301, line 12 from top, *for* five, *read* six.

„ 306. Mr C. B. Clarke has sent me the following notes regarding the plants I have named *Kyllinga monocephala* and *Heleocharis Chætaria*. 'Your *Kyllinga monocephala* is *K. brevifolia*.' 'The *Eleocharis* is a very interesting plant. The *E. albovaginata*, Bckl., is a plentiful American plant, comprising the greater part of *Chætocyperus polymorpha* of Nees—a very variable lot. Your plant is the same as Boeckeler's var. 2, *humilis*, which you will see he finds in Mauritius. It differs from the usual *polymorpha* (a green thing) in its rigid texture and ferruginous colour; but I have the same from South America and from Australia, where Mr Bentham called it *Eleocharis acicularis*.'

Page 319, line 13 from bottom, *for* ægyptia, *read* ægyptiaca.

„ 328, „ 2 „ top, *for* 100, *read* C.

„ „ „ 20 „ „ *for* style, *read* stipe.

„ 332. Mr Mitten sends the following correction :—"Since the list of Socotran mosses was made out, which contains the species therein referred to the *Anœctangium Mariei*, Bescherelle, Florule Bryologique de Réunion de Maurice, &c., p. 13, an opportunity has occurred for the examination of M. Marie's own specimens collected by himself in Nossi bé, with the result that it is found to be altogether different from the species found in Socotra, which may be described as follows:—

"*Anœctangium Balfouri*, sp. n., pusillum caulis laxe cæspitosus inferne radicellis rufis intertextus innovationibus pluribus divisus; folia inferiora fulva superiora sensim majora viridia laxiuscule inserta patentia patulave leniter recurva sicca incurva contorta oblongo ligulata acuta subintegerrima nervo concolori percurrente canaliculata dorso papillis asperulo cellulis omnibus minutis rotundatis distinctis areolata flos fœmineus juvenilis tantum visa.

"Caulis 1 cm., altus cum foliis ubi robustior 1·50 mm. latus. Folia majora 1 mm. longa, 0·25 mm. lata.

"In size and appearance this nearly resembles the species collected by the late Bishop Hannington on Kilimanjaro, and to which was inadvertently applied the name 'pusillum,' which, having already been used for two other species, should be changed for that of 'Hanningtoni.' In this the leaves are more pointed, and have not the prominent papillæ on the back of the nerve.

"Two other small species are known from this region near Socotra; these are—

"*A. Hobsoni*, sp. n., caules in cæspites densos aggregati erecti foliis erecto patentibus oblongo ligulatis apice latis subacutis paulum recurvis canaliculatis nervo lato concolori percurrente cellulis minutis rotundis obscuris basi ad nervum paucis quadratis pellucidioribus perichætialibus ovato-lanceolatis obtusis.

"Hab. Aden. Major-General Hobson.

"Caulis 2 cm. altus apice cum foliis humidis 2 mm. latus. Folia 1 mm. longa, 0·25 mm. lata olivaceo-viridia inferiora pallide fusca.

"*A. Schimperi*, sp. n., perpusillum humile caulis gracilis inferne foliis parvis ovatis acutis erectis remotiuscule insertis pallide fulvis apicalibus in comam congestis majoribus erecto patentibus secca appresse sub contortis pallide viridibus oblongo ovalibus obtusiuscule acutis sub apiculatis integerrimus nervo valido apice abrupto dorso prominulo lævi cellulis minutis rotundatis superioribus obscuriusculis non opacis basali-

bus paulo majoribus pellucidis theca in pedunculo gracili ovato-globosa operculo subulato æquilongo.

"Hab. Ex Tigrè v. Begemder. Plantæ Abyssinicæ collegit Schimper a. 1863–8. No. 1117. Herb. Kew.

"Caulis cum innovationibus 5 mm. altus cum foliis ubi in comam aggregatis humidis 1 mm. angustior, pallidus. Folia inferiora 0·52 mm., superiora 1 mm. vix attingentia pallide viridia. Pedunculus 4 mm. longus. Theca cum operculo 1·50 mm.

"Both these mosses correspond in size and appearance with the *Hymenostylium viridulum* (*Gymnostomum*, auct. plur.), and are therefore considerably less than the European *A. compactum*, which may be taken as the type of what may become an extensive group of species, all agreeing very nearly with the oldest known species, but which, when carefully compared, show a number of small differences which preclude the probability of their being varieties; in all the position of the inflorescence, as well as the form of the floral leaves, is very uniform, and of itself indicates the generic place of specimens destitute of fructification, and by this means species are known to exist in Java and also in Japan.

"To return to *Anœctangium Mariei*, the description of which is good, only, in that part relating to the male flowers, it is omitted that they are apical, a condition which at once precludes the consideration of the species being referable to *Anœctangium*, and by the habit, as also by the form of the foliage and the papillose nerve, it comes near to *Trichostomum indicum* and some other species, forming a not very well defined group standing in the *Musci Austro Americani* under Bridel's name *Plaubelia*.

"Before Lorentz left Europe he contributed a small specimen of what he had described in his Pugillus spec. nov. Exot. 160, as *Pottia* (*Hyophila*) *Roscheri*, which had been gathered by Roscher in Zanzibar. This was entirely barren, and the description merely contrasts it with *Hyophila spathulata*, a moss to which in fact it has no near resemblance; and is thus so misleading, that without his specimen its identification with the moss gathered by M. Marie by description alone would have been beyond possibility. By right of priority the name of the species must be 'Roscheri,' but its generic place is not so easily settled. During Dr Bayley Balfour's visit to the island of Mauritius he gathered a few fertile stems, from which it is seen that the fructification is in all respects similar to that of *Trichostomum indicum*, from which *T. Roscheri* differs in being a little more robust, and some other small particulars, but it is alike remote from both *Anœctangium* and *Hyophila* when compared with *H. spathulata*."

Page 403, line 4 from top, *delete* late.

„ 406, „ 6 „ „ *for* coronata, *read* coronatum.

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TABULA I.

Tab. I. Cocculus Balfourii, Schweinf. Page 2.

Fig. 1. Branch showing leaves and cladodes.

" 2. Branch showing cladodes and succession of leafing shoots.

" 3. Branch showing branching of cladodes.

" 4. Portion of twig with clusters of flowers.

" 5. Cladode with fruits attached.

" 6. Staminate flower expanded, seen from above.

" 7. Back view of isolated stamen and lateral view of stamen with petal.

" 8. Pistillate flower.

" 9. Pistillate flower opened and petals removed.

" 10. Face view of sepal of pistillate flower.

" 11. Isolated petals with staminodes of pistillate flower.

" 12. Lateral view of fruit.

" 13. End view of fruit.

" 14. Median section of fruit.

" 15. Seed in section removed from fruit, showing embryo.

1–5 natural size; others magnified. Drawn from dried and spirit-specimens.

J.N. Fitch del. et lith.

J.N. Fitch imp.

Cocculus Balfourii, *Schweinf.*

TABULA II.

Tab. II. Diceratella incana, Balf. fil. Page 4.

Fig. 1. Portion of plant showing habit.

" 2. Twigs with flowers and fruit.

" 3. Petal.

" 4. Foliage-leaf enlarged to show clothing.

" 5. Same leaf, natural size.

" 6. Flower.

" 7. Stamen.

" 8. Fruit.

" 9. Views of apex of fruit; centre figure shows septate interior of valve; figure to right shows outside of valve; figure to left shows replum, false septum, and seeds.

" 10. Seed.

1, 2, and 5 natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.

H.T.D. del. J.N. Fitch lith.

J.N. Fitch imp.

Diceratella incana, *Balf. fil.*

TABULA III.

Tab. III. **Lachnocapsa spathulata,** Balf. fil. Page 8.

Fig. 1. Branch showing habit.

" 2. Foliage-leaf showing clothing.

" 3. Flower.

" 4. Petal.

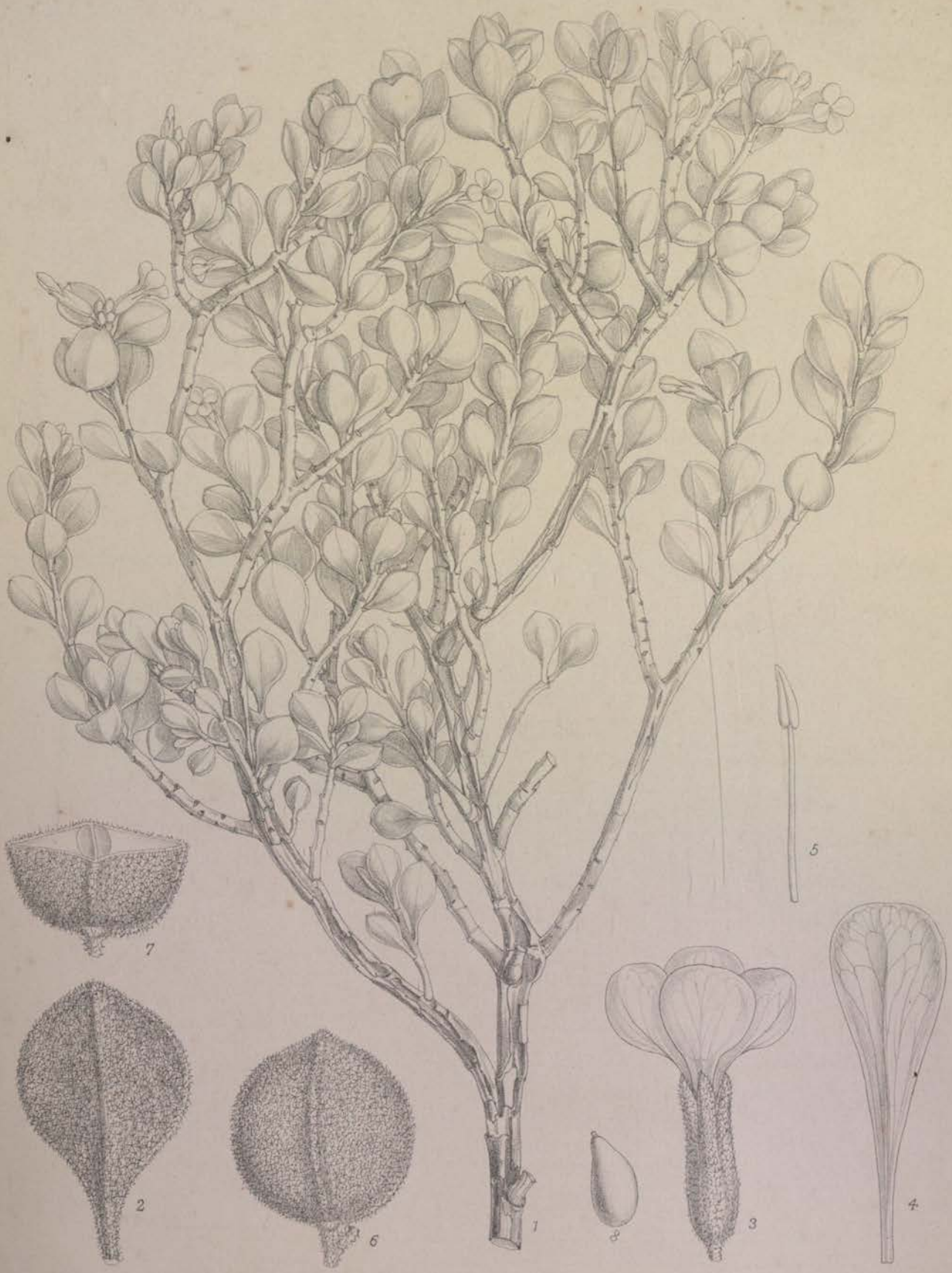
" 5. Stamen.

" 6. Fruit, side view.

" 7. Fruit in transverse section.

" 8. Seed.

1 natural size ; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.



H.H.D. del. J.N. Fitch lith.

J.N. Fitch imp.

Lachnocapsa spathulata, *Balf. fil.*

TABULA IV.

Tab. IV., A. Hypericum scopulorum, Balf. fil. Page 27.

Fig. 1. Branch showing habit.

" 2. Pedicel bearing the calyx, and with bracteoles.

B. Hypericum tortuosum, Balf. fil. Page 28.

Fig. 1. Branch showing habit.

" 2. Flower expanded.

" 3. Calyx seen from below.

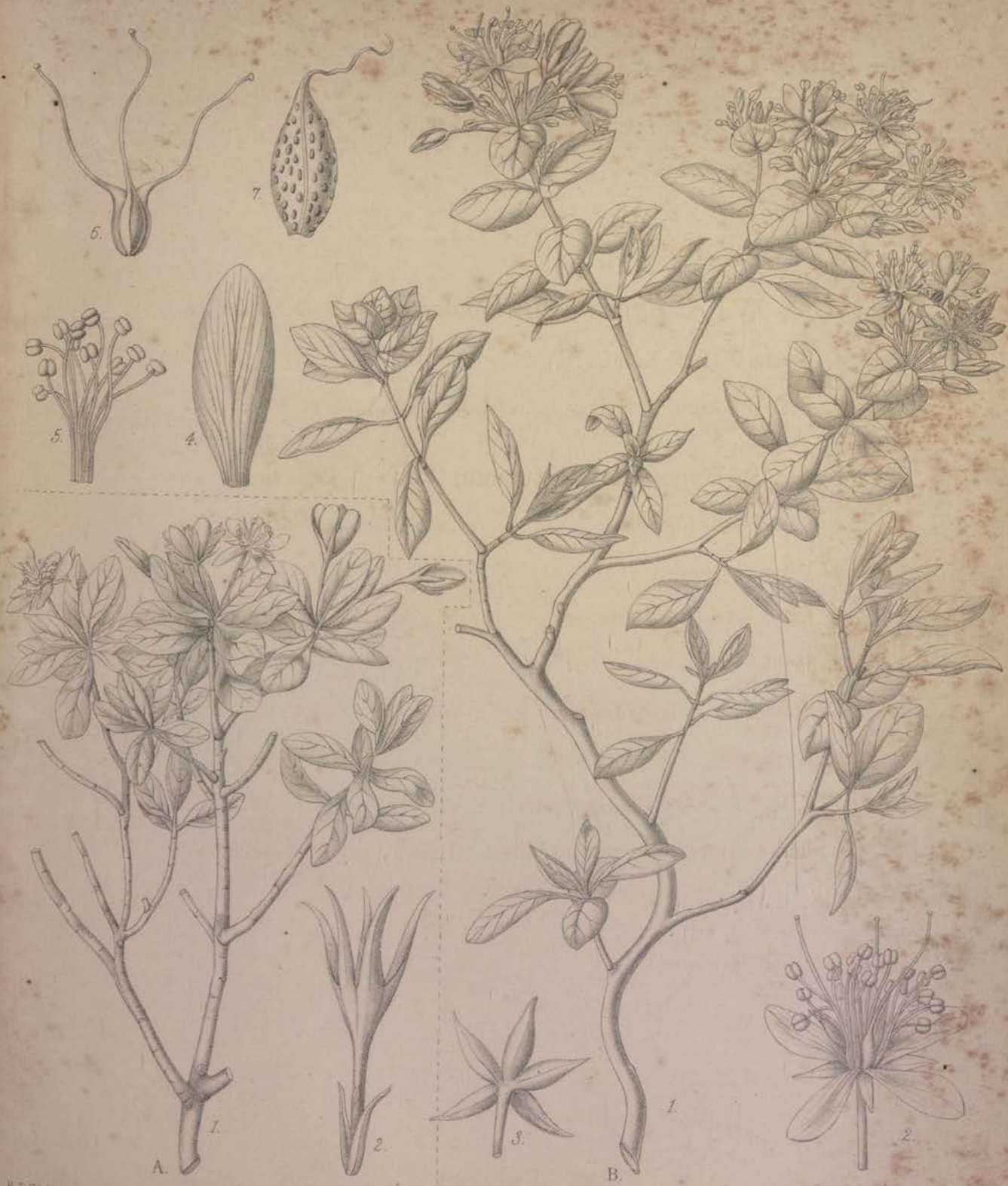
" 4. Petal.

" 5. Stamen showing its branches.

" 6. Gynæceum.

" 7. Valve of capsule showing warts.

1 and 3 natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.



A. Hypericum scopulorum, *Balf. fil.*
B. Hypericum tortuosum, *Balf. fil.*

TABULA V.

Tab. V., A. Hibiscus Scotti, Balf. fil. Page 32.

Branch with flower and fruit.

Fig. 1. Dissected flower, corolla and androecium removed.

" 2. Anther.

" 3. Ovary in transverse section.

" 4. Fruit dehiscing.

" 5 Seed.

B. Hibiscus stenanthus, Balf. fil. Page 32.

Branch with flowers.

Fig. 1. Dissected flower, corolla and androecium removed.

" 2. Ovary in transverse section surrounded by epicalyx.

All numbered figures magnified. Drawn from dried specimens by Mr J. N. Fitch.

A. Hibiscus Scotti, *Balf. fil.*
B. Hibiscus stenanthus, *Balf. fil.*

TABULA VI.

Tab. VI., A. Melhania muricata, Balf. fil. Page 35.

Fig. 1. Branch showing habit.

" 2. Foliage-leaf.

" 3. Lobe of involucre.

" 4. Involucre seen from above surrounding flower-bud.

" 5. Sepal.

" 6. Corolla isolated, showing imbricate twisted æstivation.

" 7. Corolla with andrœcium opened out, the petals still remaining attached at the apex.

" 8. Petal.

" 9. Portion of andrœcium showing stamen and staminode.

" 10. Style with its branches.

" 11. Fruit in vertical section.

" 12. Seed.

B. Thamnosma socotrana, Balf. fil. Page 48.

Fig. 1. Branch showing habit.

" 2. Foliage-leaf, showing upper and under surfaces.

" 3. Flower in vertical section.

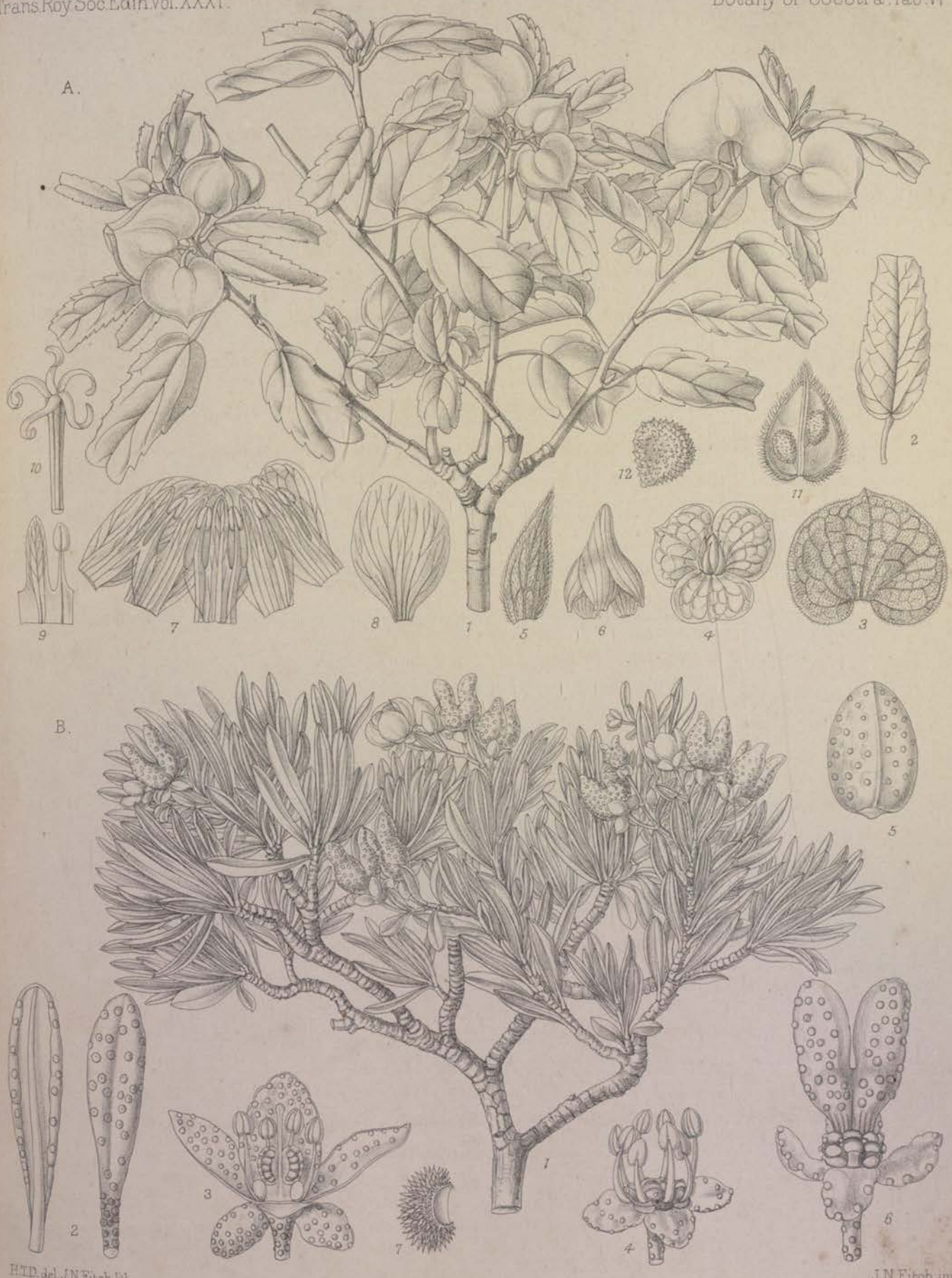
" 4. Dissected flower, the corolla and gynæceum removed.

" 5. Back view of a carpel of ovary.

" 6. Fruit surrounded by calyx.

" 7. Seed.

1 in both A and B natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.



H.T.D. del. J.N. Fitch lith.

J.N. Fitch imp.

A. Melhania muricata, *Balf. fil.*

B. Thamnosma socotrana, *Balf. fil.*

TABULA VII.

Tab. VII., A. Nirarathamnos asarifolius, Balf. fil. Page 106.

Fig. 1. Branch showing habit.

" 2. Expanded flower.

" 3. Petal.

" 4. Ovary after fall of corolla and androecium.

" 5. Fruit.

" 6. Fruit in transverse section.

B. Corchorus erodioides, Balf. fil. Page 39.

Fig. 1. Two plants showing habit; the one on the right shows flowers, that on the left shows fruit.

" 2. Flower partially expanded.

" 3. Expanded flower.

" 4. Petal.

" 5. Stamens and gynæceum.

" 6. Fruits.

1 in both A and B natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.

W.H. Fitch lith. Hanhart imp.

A Niraparhamnos asarifolius, *Balf. fil.*
B Corchorus erodioides, *Balf. fil.*

TABULA VIII.

Tab. VIII. Dirachma socotrana, Schweinf. Page 46.

Three branches are shown,—one in the centre with elongated twigs bearing flowers and fruits; one on the left with contracted lateral shoots with large leaves; the one at the top of the plate has very small leaves.

Fig. 1. Flower-bud.

" 2. Young fruit.

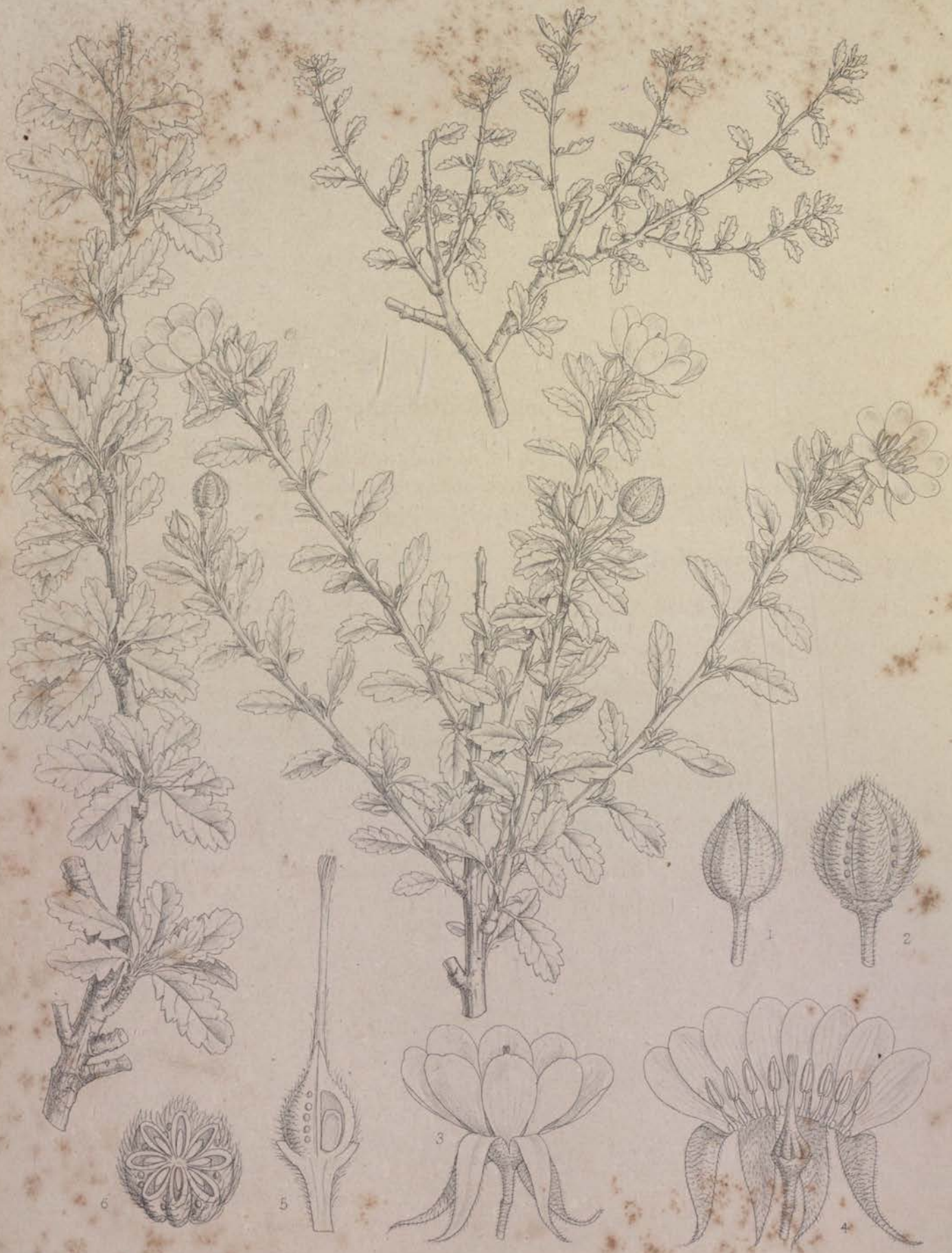
" 3. Flower on its pedicel.

" 4. Flower dissected, the calyx, corolla, and androecium together raised from around the gynæceum.

" 5. Gynæceum in vertical section.

" 6. Young fruit in transverse section.

All numbered figures magnified. Drawn from dried specimens by Mr J. N. Fitch.



J.N. Fitch, lith.

Dirachma socotrana, *Schweinf.*

J.N. Fitch, imp.

TABULA IX.

Tab. IX. Boswellia Ameero, Balf. fil. Page 49.

Fig. 1. Summit of a branch with an inflorescence and the bases of petioles.

" 2. Single leaf.

" 3. Flower bisected.

" 4. Petal.

" 5. Dissected flower showing gynæceum and disk.

" 6. Stamen.

" 7. Portion of branch of inflorescence with two fruits.

1, 2, and 7 natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.

H.T.D. del. J.N. Fitch lith.

J.N. Fitch imp.

Boswellia Ameero, *Balf. fil.*

TABULA X.

Tab. X. Boswellia elongata, Balf. fil. Page 50.

Fig. 1. End of branch, with inflorescence and leaves.

" 2. Fully expanded flower.

" 3. Bisected flower.

" 4. Petals, back and face views.

" 5. Stamen, back and face views.

" 6. Portion of branch of inflorescence, with unopened flower and very young fruit.

1 natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.

Boswellia elongata, *Balf. fil.*

TABULA XI.

Tab. XI. Boswellia socotrana, Balf. fil. Page 51.

Fig. 1 and 2. Branches showing habit, and with inflorescences.

" 3. Flower-bud.

" 4. Petal, back and face views.

" 5. Stamens, two forms.

6. Nearly bisected flower.

" 7. Fruit.

" 8. Valve of fruit.

1 and 2 natural size ; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.

H.T.D. del. J.N. Fitch lith.

J.N. Fitch imp

Boswellia socotrana, *Balf. fil.*

TABULA XII.

Tab. XII. Balsamodendron socotranum, Balf. fil. Page 54.

Fig. 1. Branch showing habit and small entire form of leaves; a second branch is added on the left of the plate showing large leaves, some of which are lobed and divided, and on the topmost twig a trifoliolate one is represented.

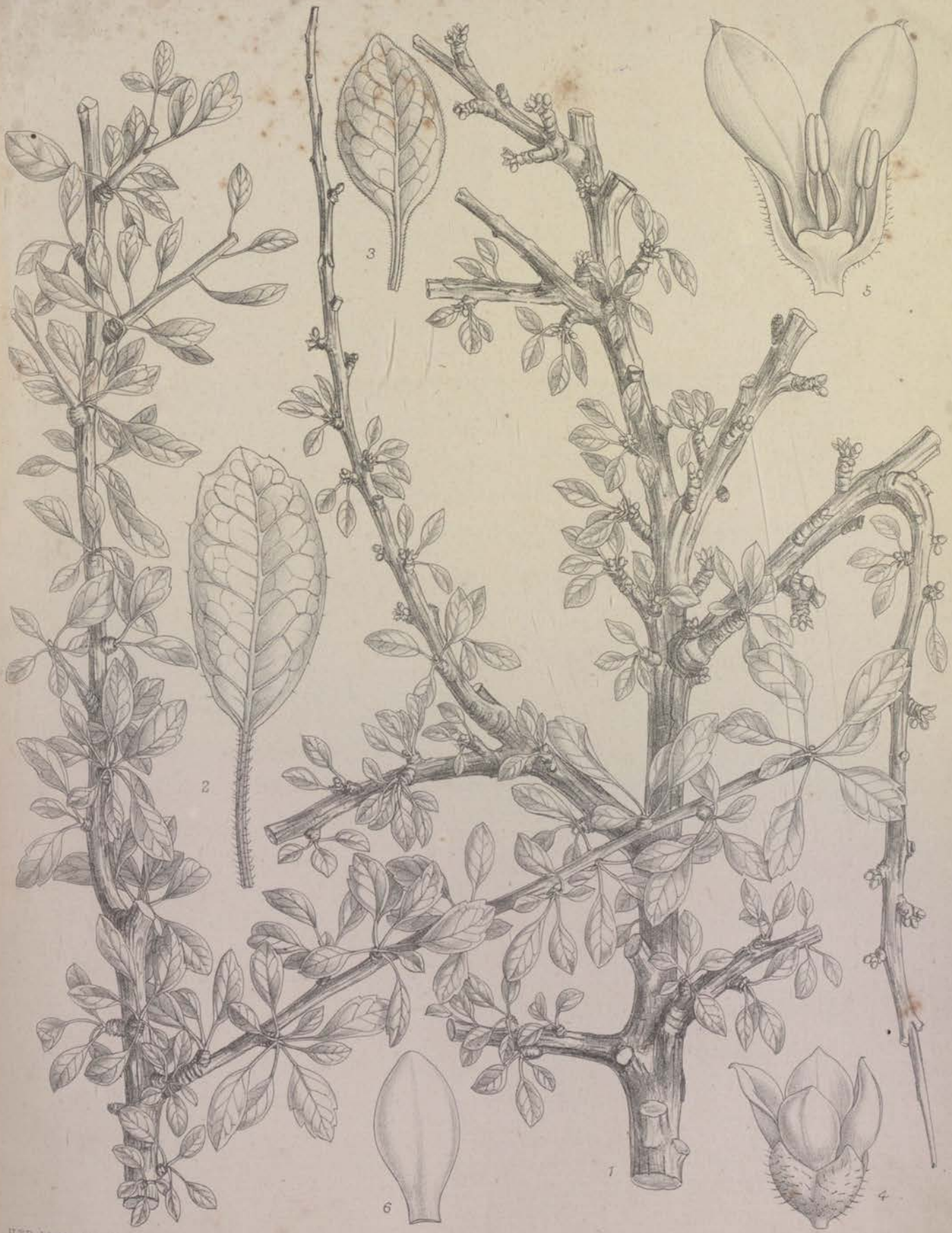
" 2 and 3. Two foliage-leaves.

" 4. Male flower.

" 5. Bisected male flower.

" 6. Petal.

1 and the unnumbered figure of a branch, natural size; rest magnified. Drawn from dried and spirit-specimens by Mrs Thiselton-Dyer.



H.T.D. del. J.N. Fitch lith.

J.N. Fitch imp.

Balsamodendron socotranum, *Balf. fil.*

TABULA XIII.

Tab. XIII. Balsamodendron planifrons, Balf. fil. Page 55.

Fig. 1. Shows habit of plant.

" 2. Branch with large leaves.

" 3 and 4. Foliage-leaf, back and face views, from branch in fig. 7.

" 5. Leaflets of 3 and 4.

" 6. Foliage-leaf from branch in fig. 2.

" 7. Branch with smaller leaves.

" 8. Summit of twig with unopened flower.

" 9. Ovary and stigma.

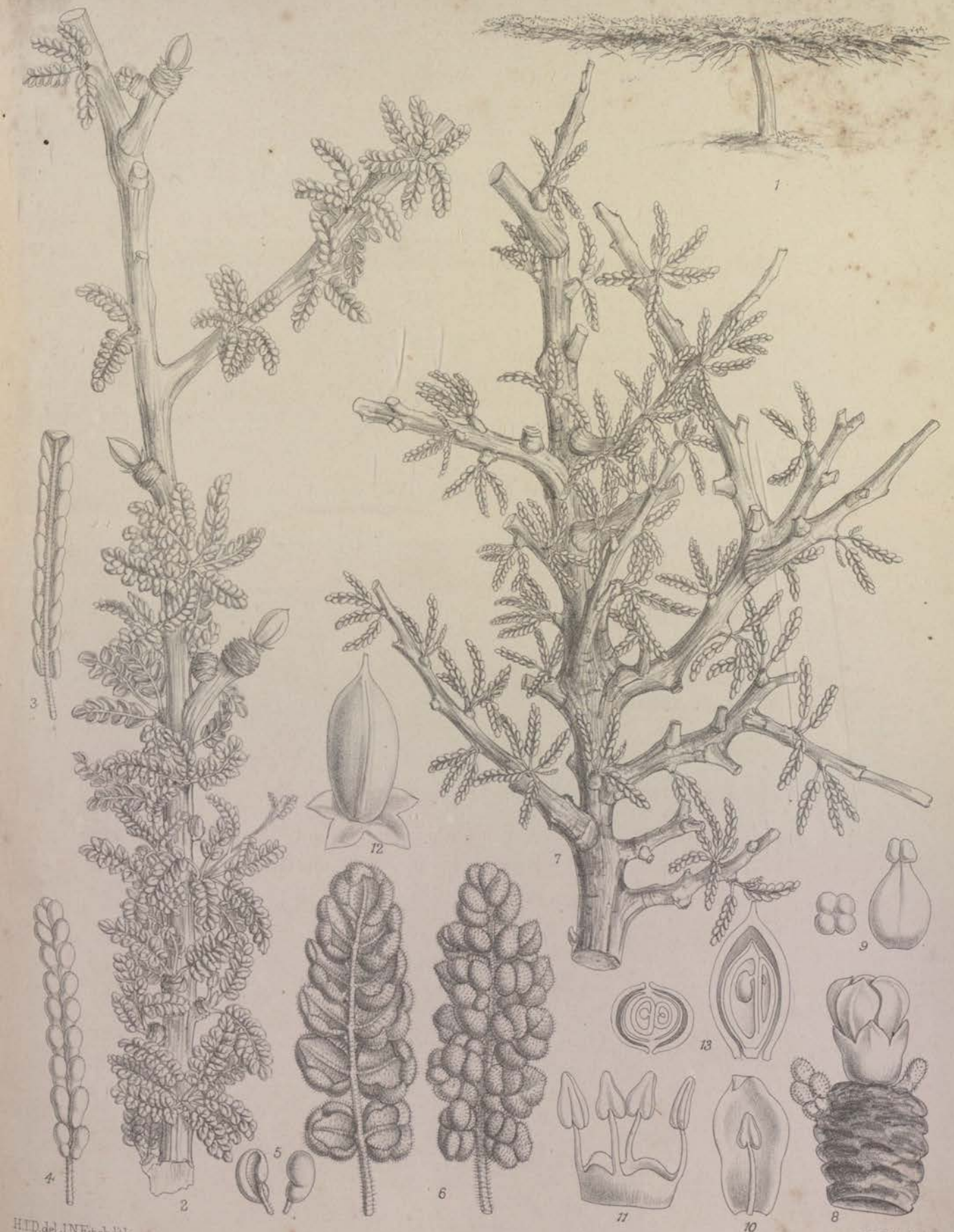
" 10. Petal and stamen.

" 11. Androecium and disk.

" 12. Fruit.

" 13. Fruit in section, vertical and in transverse.

2 and 7 natural size, 1 reduced, rest magnified. Figures 2, 3, 4, and 7 were drawn from dried specimens by Mrs Thiselton-Dyer; the others were drawn by Dr Schweinfurth.



H.F.D. del. J.N. Fitch lith.

J.N. Fitch imp.

Balsamodendron planifrons, *Balf. fil.*

TABULA XIV.

Tab. XIV, A. Crotalaria leptocarpa, Balf. fil. Page 66.

Figs. 1 and 2. Two forms of the plant.

Fig. 3. Flower.

" 4. Vexillum.

" 5. Ala.

" 6. Carina.

" 7. Androecium enclosing gynæceum.

" 8. Androecium opened out.

" 9. Free portions of two stamens.

" 10. Gynæceum.

B. Crotalaria pteropoda, Balf. fil. Page 67.

Fig. 1. Shows habit.

" 2. Flower seen from the back.

" 3. Vexillum.

" 4. Ala.

" 5. Carina.

" 6. Androecium enclosing gynæceum; free portions of two stamens also shown.

" 7. Gynæceum.

" 8. Seed.

1 and 2 in A, and 1 in B, natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.

A. Crotalaria leptocarpa, *Balf. fil.*
B. Crotalaria pteropoda, *Balf. fil.*

TABULA XV.

Tab. XV. Priotropis socotrana, Balf. fil. Page 68.

Fig. 1. Branch showing habit.

" 2. Flower.

" 3. Dissected flower, corolla and andrœcium removed.

" 4. Vexillum.

" 5. Ala.

" 6. Carina.

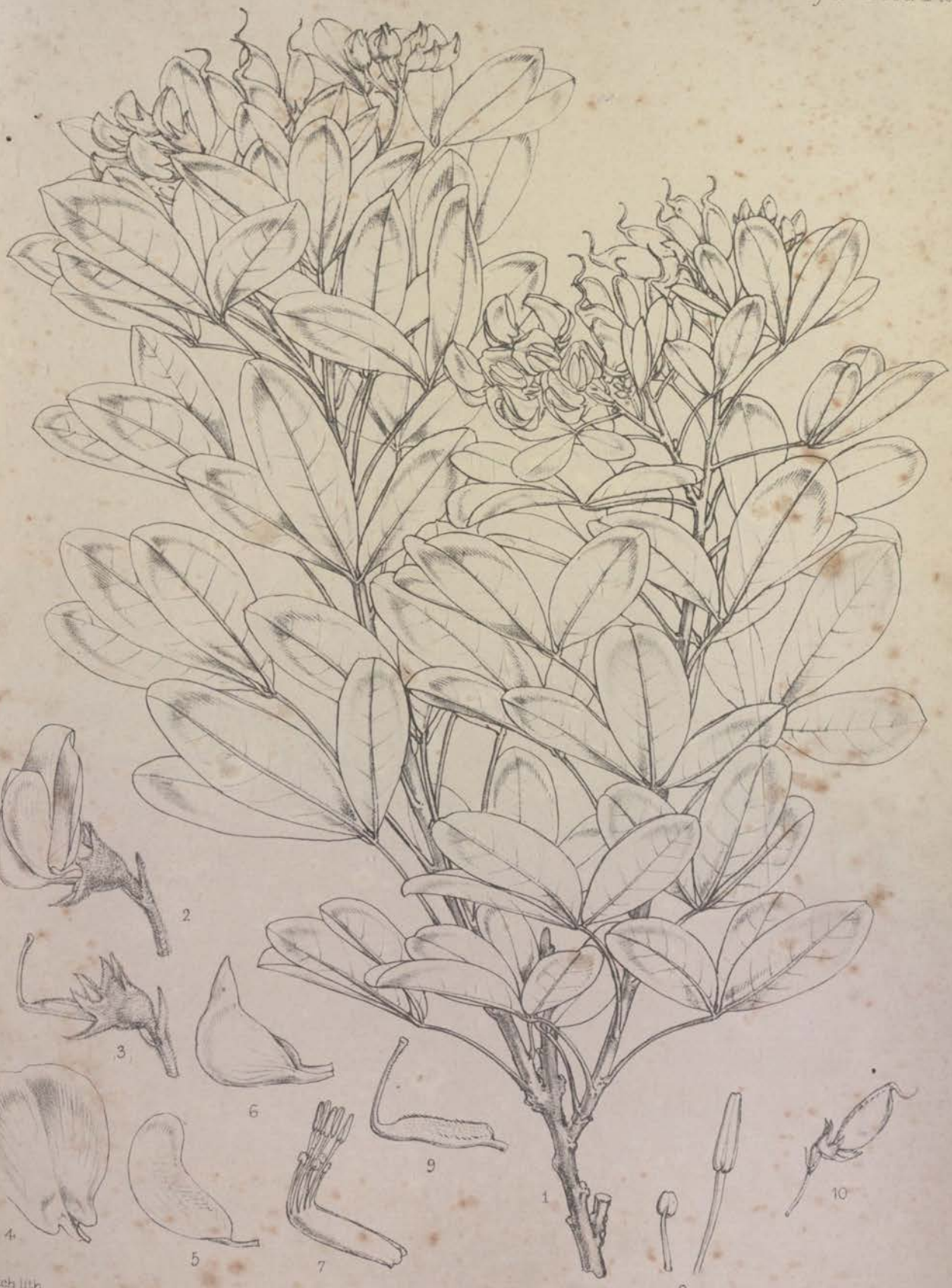
" 7. Andrœcium.

" 8. Free portions of two stamens.

" 9. Gynæceum.

" 10. Fruit.

1 natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.



W. H. Fitch lith.

Priotropis socotrana, *Balf. fil.*

Hanhart imp.

TABULA XVI.

Tab. XVI. Lotus ononopsis, Balf. fil. Page 71.

Figs. 1 and 2. Two forms of the plant, one with narrow, the other with broad leaves.

Fig. 3. Flower.

" 4. Vexillum.

" 5. Ala.

" 6. Carina.

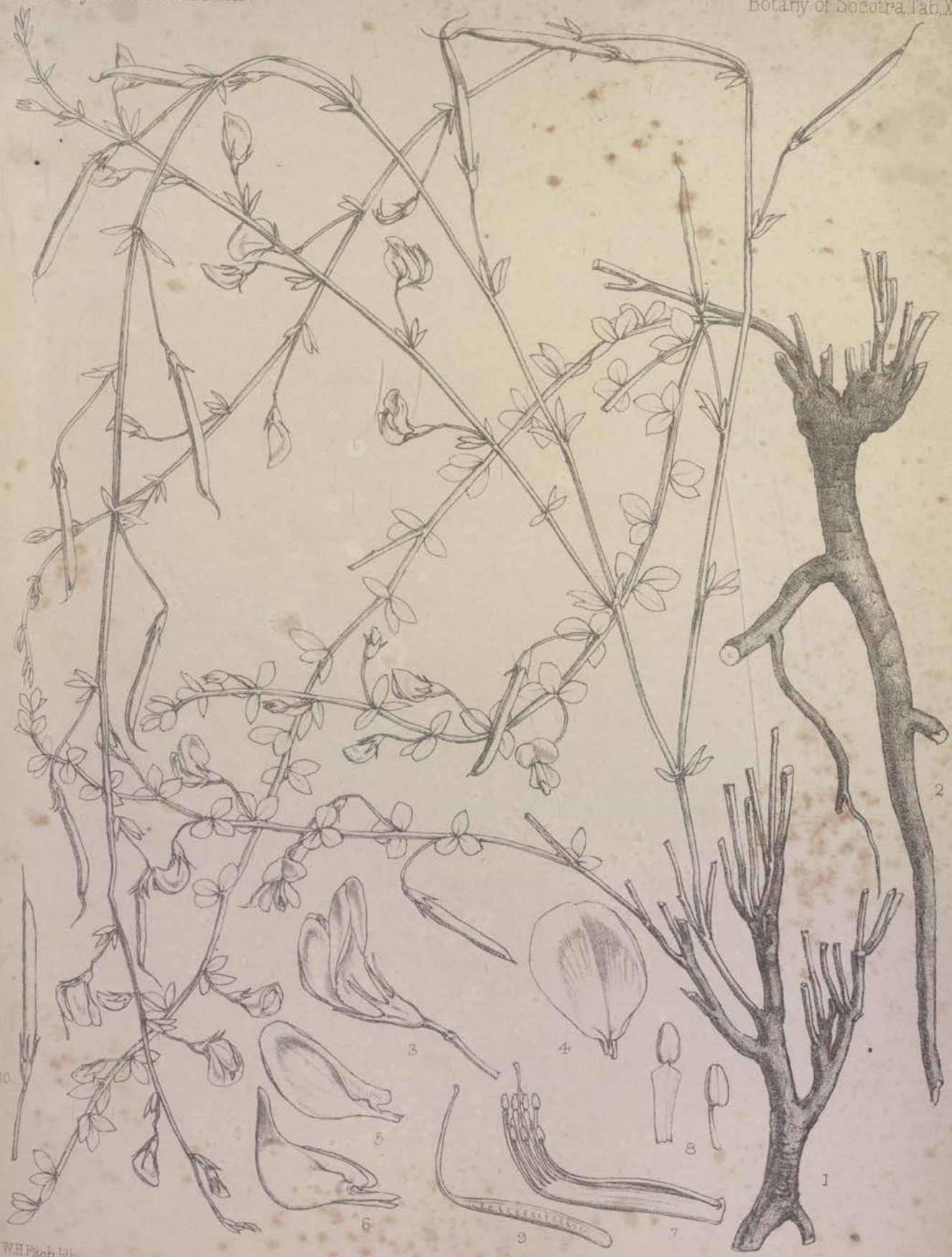
" 7. Androecium enclosing gynæceum.

" 8. Free portions of two stamens.

" 9. Gynæceum.

" 10. Fruit.

1, 2, and 10 natural size; rest magnified. Drawn from dried specimens by Mr W.H. Fitch.



W.H.Fitch lith.

Lotus ononopsis, *Balf. fil.*

Hanhart imp.

TABULA XVII.

Tab. XVII, A. Lotus mollis, Balf. fil. Page 72.

Fig. 1. Shows habit.

" 2. Flower.

" 3. Vexillum.

" 4. Carina.

" 5. Ala.

" 6. Androecium.

" 7. Gynæceum.

" 8. Free portions of two stamens.

" 9. Fruit.

B. Eureiandra Balfourii, Cogn. Page 97.

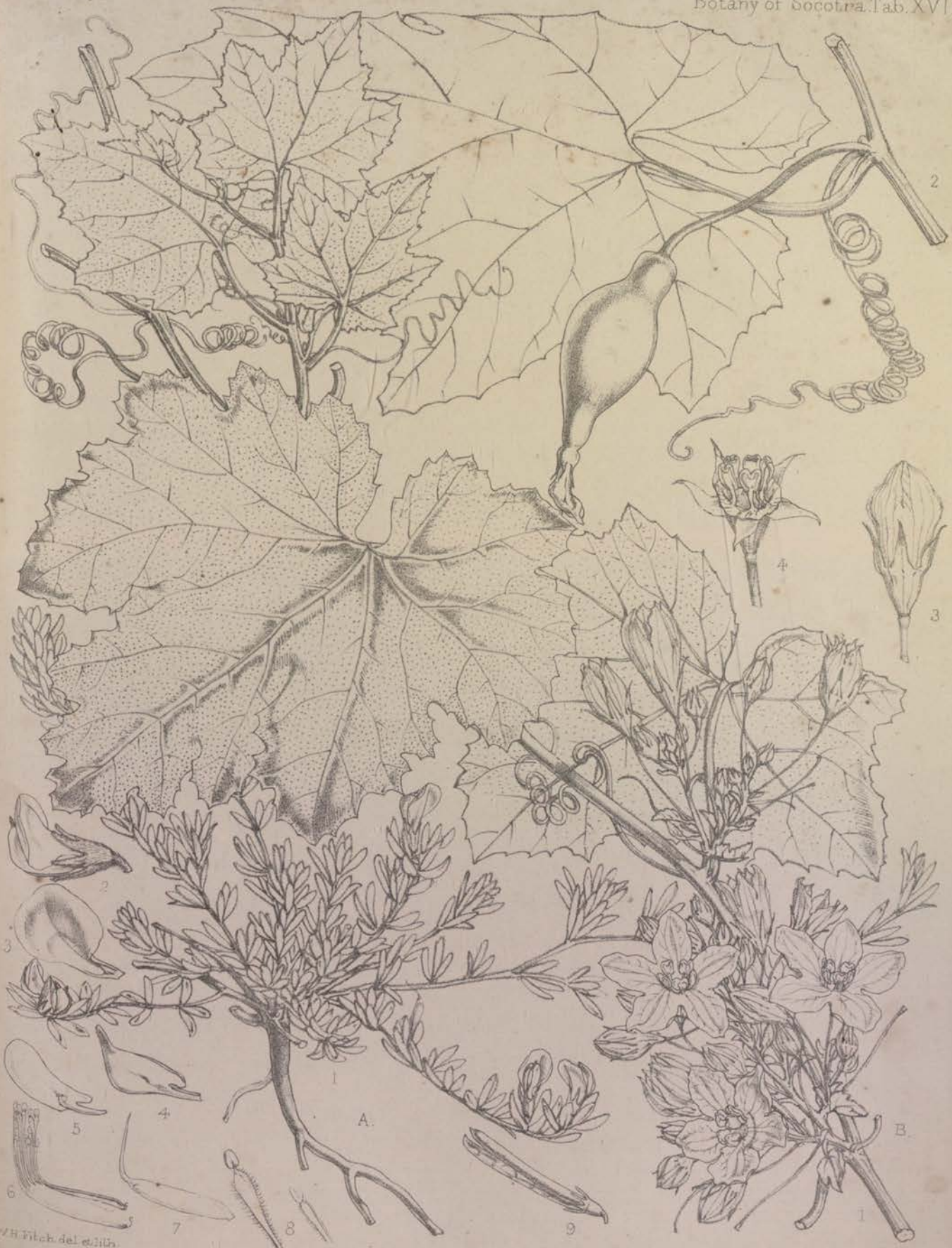
Fig. 1. Branch with male inflorescence.

" 2. Portion of branch with young fruit.

" 3. Male flower bud.

" 4. Male flower expanded.

1 in A, 1 and 2 in B, natural size; rest magnified. Drawn from dried specimens.



A. Lotus mollis, *Balf. fil.*
B. Eureiandra Balfourii, *Cogn.*

TABULA XVIII.

Tab. XVIII, A. Indigofera nephrocarpa, Balf. fil. Page 73.

Figs. 1 and 2. Two forms of the plant; one lax with large leaves, the other compact with small leaves.

Fig. 3. Flower.

" 4. Vexillum.

" 5. Ala.

" 6. Carina.

" 7. Androecium enclosing gynæceum.

" 8. Free portion of a stamen.

" 9. Gynæceum.

" 10. Fruit.

B. Indigofera marmorata, Balf. fil. Page 75.

Fig. 1. Branch with clusters of fruit.

" 2. Branch with flowers.

" 3. Flower.

" 4. Vexillum.

" 5. Ala.

" 6. Carina.

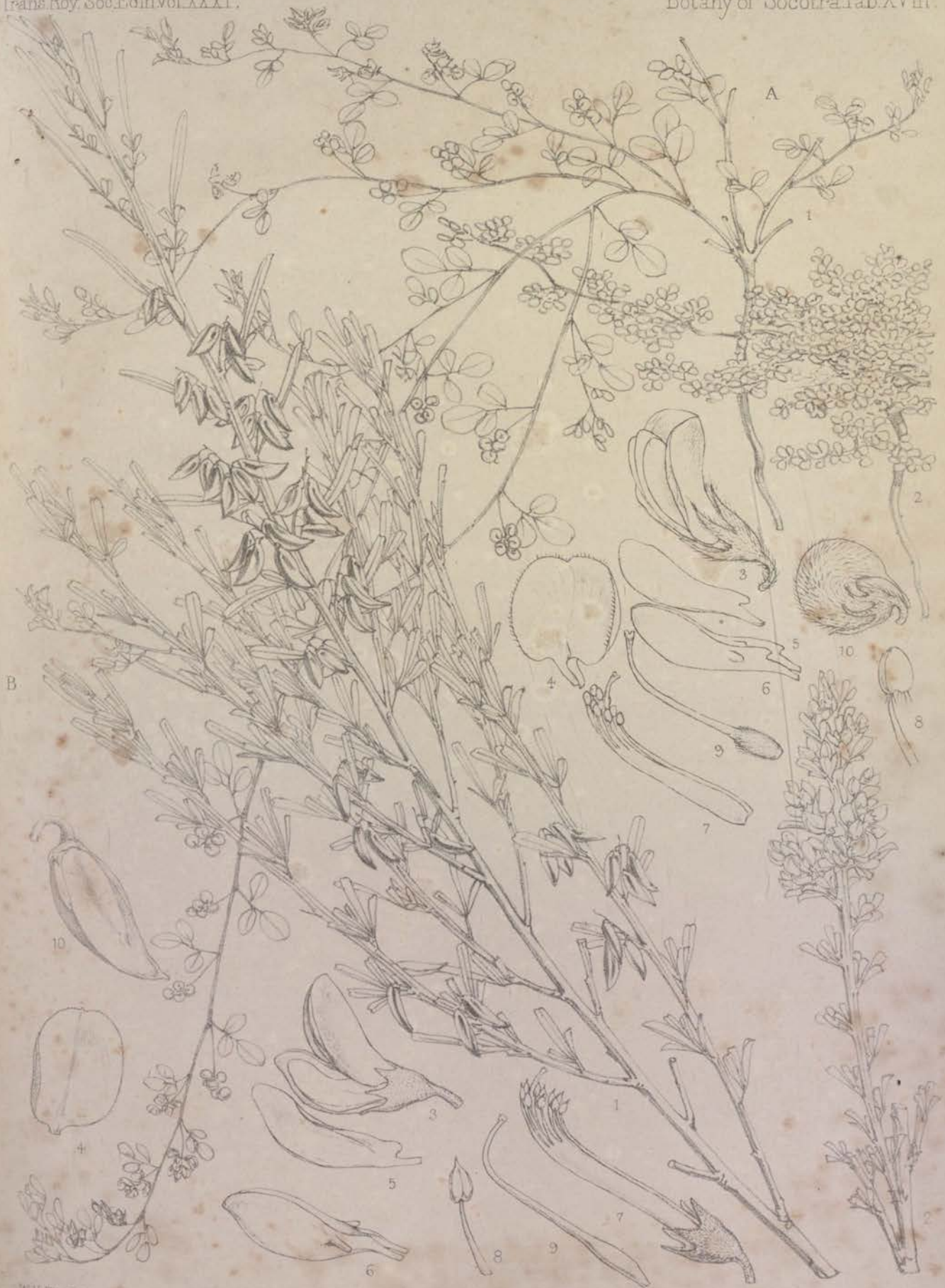
" 7. Flower with corolla removed.

" 8. Free portion of a stamen.

" 9. Gynæceum.

" 10. Fruit.

1 and 2, in both A and B natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.



W.H. Fitch, lith.

Hanhart imp.

A. Indigofera nephrocarpa, *Balf. fil.*
B. Indigofera marmorata, *Balf. fil.*

TABULA XIX.

Tab. XIX. Taverniera sericophylla, Balf. fil. Page 78.

Fig. 1. Branch with flowers.

" 2. Flower seen obliquely and posteriorly.

" 3. Flower seen obliquely and anteriorly.

" 4. Vexillum.

" 5. Ala.

" 6. Carina.

" 7. Androecium.

" 8. Free portion of a stamen, back and face views.

" 9. Gynaeceum.

1 natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.

W.H. Fitch lith.

Taverniera sericophylla, *Balf. fil.*

Hanhart imp.

TABULA XX.

Tab. XX. Ormocarpum cæruleum, Balf. fil. Page 79.

Fig. 1 and 2. Branches showing habit.

" 3. Leaflet.

" 4. Flower.

" 5. Calyx opened out.

" 6. Vexillum.

" 7. Ala.

" 8. Carina.

" 9. Androecium.

" 10. Free portion of a stamen.

" 11. Gynæceum.

1 and 2 natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.

W.H. Fitch lith.

Ormocarpum cæruleum, *Balf. fil.*

Hanhart imp.

TABULA XXI.

Tab. XXI. Arthrocarpum gracile, Balf. fil. Page 81.

Fig. 1. Branch showing habit, and with flower and fruit.

" 2. Flower.

" 3. Vexillum.

" 4. Ala.

" 5. Carina.

" 6. Flower partly dissected.

" 7. Flower dissected, showing tubular portion of calyx with portion of androecium enclosing gynæceum.

1 natural size; rest magnified. Figures 1–5 drawn from dried specimens by Mr W. H. Fitch; figures 6 and 7 drawn by Miss Smith.

W.H. Fitch. del. et lith.

Arthrocarpum gracile, *Balf. fil.*

Hanhart. imp.

TABULA XXII.

Tab. XXII. Dichrostachys dehiscens, Balf. fil. Page 87.

Fig. 1. Branch with flower and fruit.

" 2. Base of foliage-leaf.

" 3. Neuter flower.

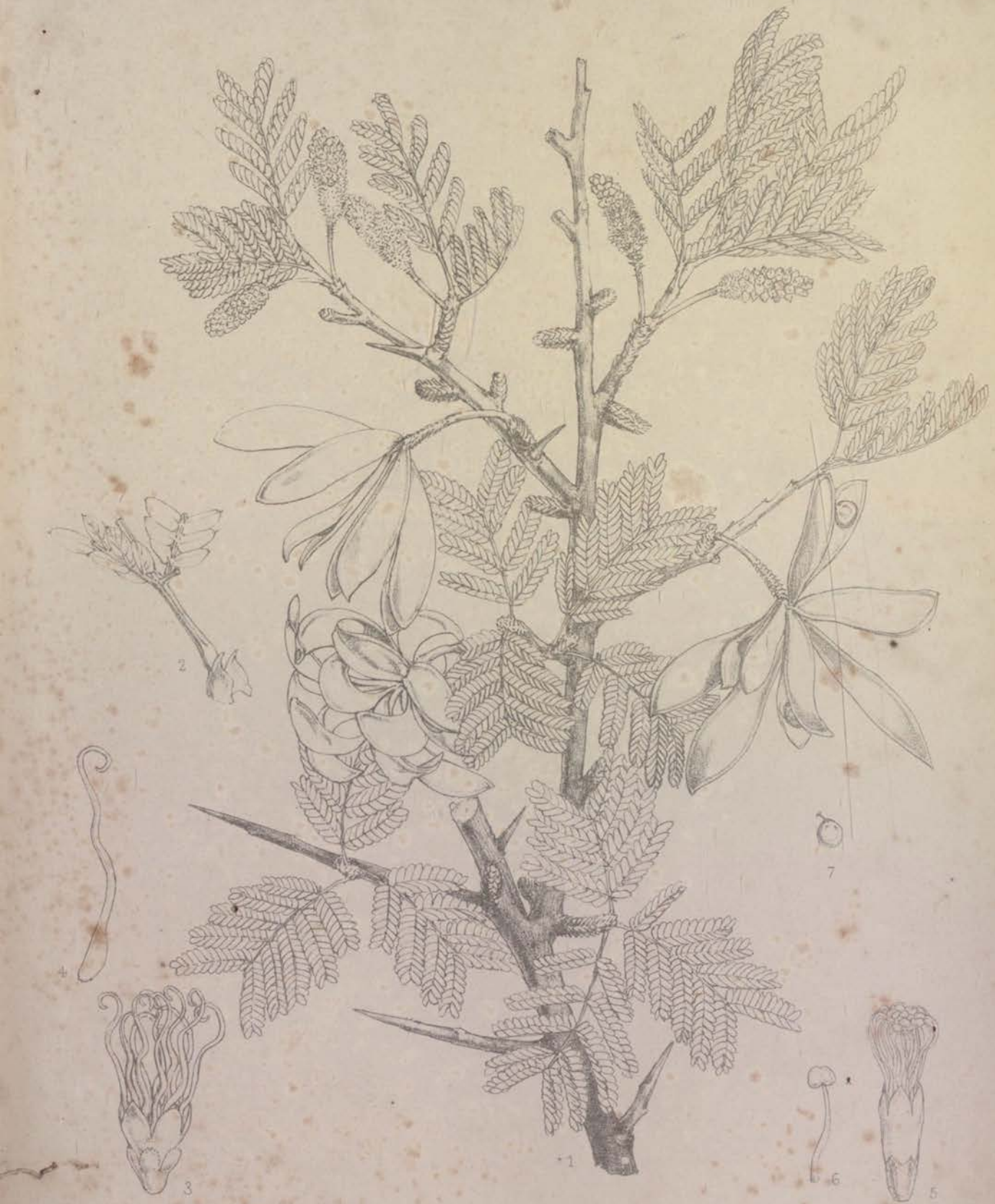
" 4. Staminode.

" 5. Hermaphrodite flower.

" 6. Portion of a stamen.

" 7. Young seed.

1 natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.



W.H. Fitch lith.

Dichrostachys dehiscens, *Balf. fil.*

Hanhardt imp.

TABULA XXIII.

Tab. XXIII. Acacia socotrana, Balf. fil. Page 87.

Figs. 1 and 2. Branches showing habit.

Fig. 3. Inflorescence with bracteoles.

" 4. Flower and bract.

" 5. Calyx opened out.

" 6. Corolla opened out.

" 7. Portion of a stamen, back and face views

" 8. Fruits.

" 9. Seeds.

" 10. Seed in transverse section.

'1, and 2 natural size; rest magnified. Drawn from dried specimens by Mr W. H. Fitch.

Acacia socotrana, *Balf. fil.*

TABULA XXIV.

Tab. XXIV. Acacia pennivenia, Schweinf. Page 88.

Fig. 1. Branch showing leaves and inflorescence.

" 2. Portion of branch with leaf and stipules.

" 3. Adventitious twig with small leaves and spines.

" 4. Inflorescence with bracteoles.

" 5. Axis of inflorescence from which flowers are removed.

" 6. Flower and bract.

" 7. Calyx opened out.

" 8. Corolla opened out.

" 9. Portion of stamen, back and face views.

1, 2, and 3 natural size; rest magnified. Drawn from dried specimens.

W.H.Fitch del. et lith.

Hanhart. imp.

Acacia pennivenia, *Schweinf.*

TABULA XXV.

Tab. XXV. Punica protopunica, Balf. fil. Page 96.

Fig. 1. Branch with flowers.

" 2. Flower-bud in vertical section; the placentas are represented too convex.

" 3. Expanded flower in vertical section, the line of section not including the gynæceum.

" 4. Gynæceum on bibracteolate flower-stalk.

" 5. Two stamens.

" 6. Transverse section of ovary. The placentas are incorrectly represented; they cover the floor of each loculus, and are not attached to the central axis of the ovary, as shown in the figure.

" 7. Fruit.

" 8. Frui tin vertical section.

1 natural size; rest magnified. Drawn from dried and spirit-specimens by Mr W. H. Fitch.

Punica protopunica. *Balf fil.*

TABULA XXVI.

Tab. XXVI. Dendrosicyos socotrana, Balf. fil. Page 100.

Fig. 1. Shows habit of tree.

" 2. Portion of twig with large foliage-leaves.

" 3. Portion of twig with small and much divided foliage-leaves.

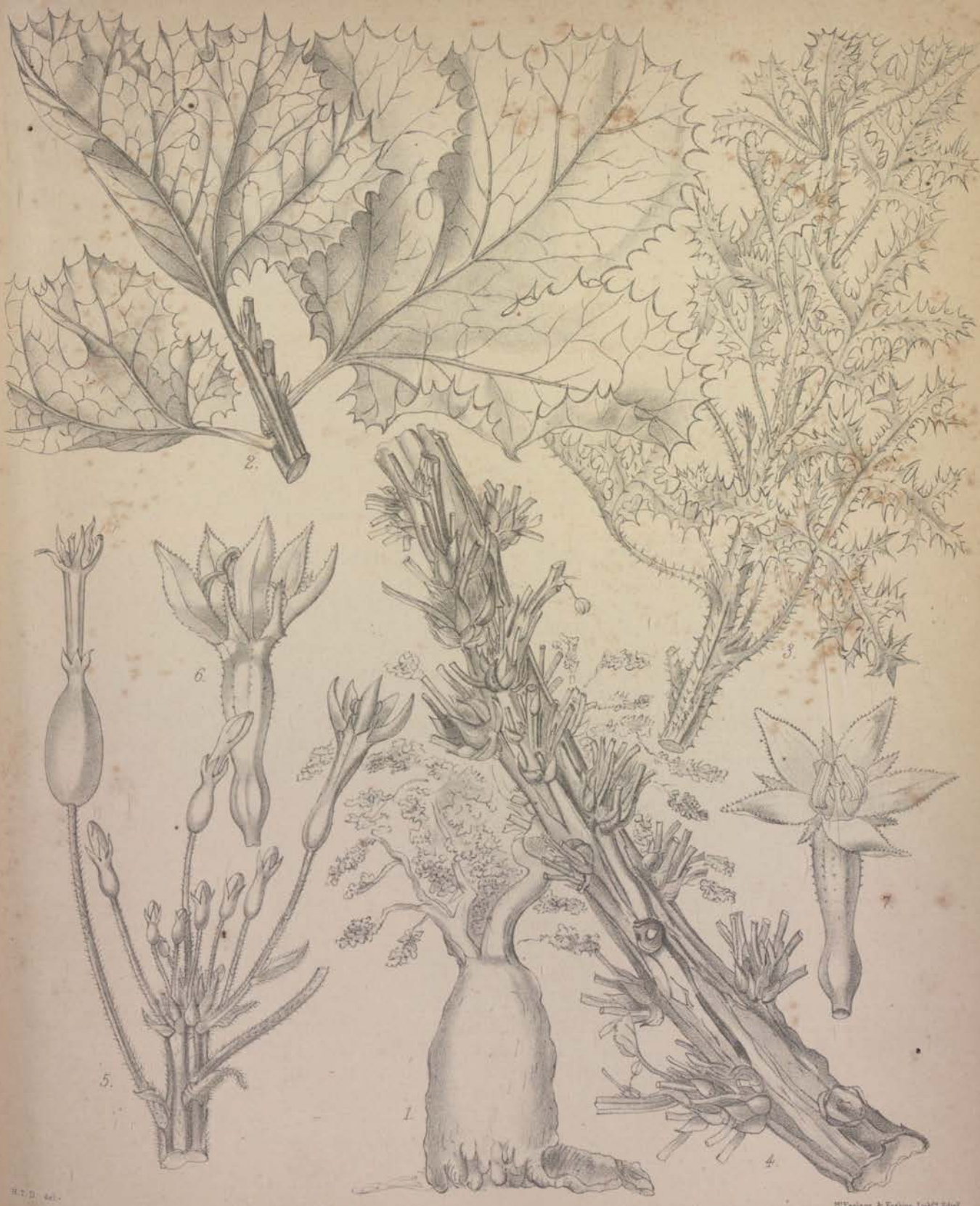
" 4. Portion of dried branch.

" 5. Portion of twig bearing pistillate flowers.

" 6. Staminate flower; lateral view.

" 7. Staminate flower; seen obliquely from above.

1 reduced; 5, 6, 7 magnified; rest natural size. Figs 1 and 5 copied from sketches by Schweinfurth, the others drawn from dried specimens by Mrs Thiselton-Dyer.



Dendrosicyos socotrana. *Balf. fil.*

TABULA XXVII.

Tab. XXVII, A. Dirichletia obovata, Balf. fil. Page 111.

Branch with foliage-leaves and fruit.

B. Dirichletia obovata, Balf. fil. var. albescens. Page 111.

Portion of twig with fruit showing narrower foliage-leaves.

C. Dirichletia venulosa, Balf. fil. Page 110.

Branch with flowers.

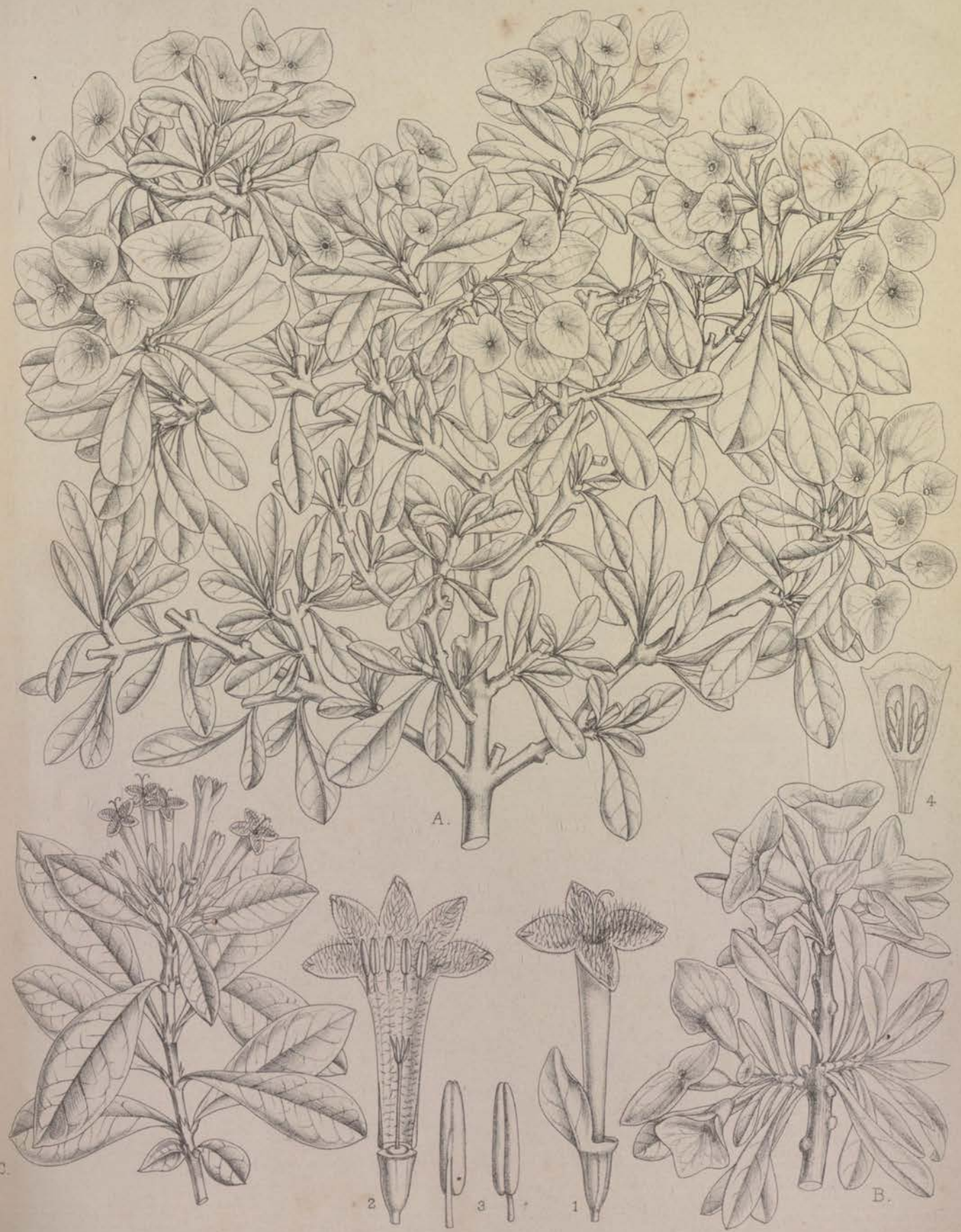
Fig. 1. Long-styled flower.

" 2. Short-styled flower opened.

" 3. Anther; back and face views.

" 4. Ovary in vertical section.

All numbered figures in A, B, and C magnified. Drawn from dried specimens.



M. Smith del.

A. Dirichletia obovata, *Balf. fil.*
B. Dirichletia obovata, *var* albescens, *Balf. fil.*
C. Dirichletia venulosa, *Balf. fil.*

J. N. Fitch lith.

TABULA XXVIII.

Tab. XXVIII. Placopoda virgata, Balf. fil. Page 112.

Fig. 1. Branch with fruit showing habit.

" 2. Branch with flowers.

" 3. Portion of the dwarfed form of the plant; in some clusters too many leaves are represented.

" 4. Flower expanded.

" 5. Dissected flower, corolla and androecium removed.

" 6. Fruit, side view.

" 7. Fruit in vertical section.

" 8. Placenta with one seed and two undeveloped ovules.

1, 2, 3 natural size; rest magnified. Drawn from dried specimens.

M. Smith del. J. N. Fitch lith.

J. N. Fitch imp.

Placopoda virgata, *Balf. fil.*

TABULA XXIX.

Tab. XXIX. Mussænda capsulifera, Balf. fil. Page 116.

Fig. 1. Branch with flowers and fruits.

" 2. Dissected flower, corolla and andrœcium removed.

" 3. Corolla with andrœcium opened out.

" 4. Anther; back and face views.

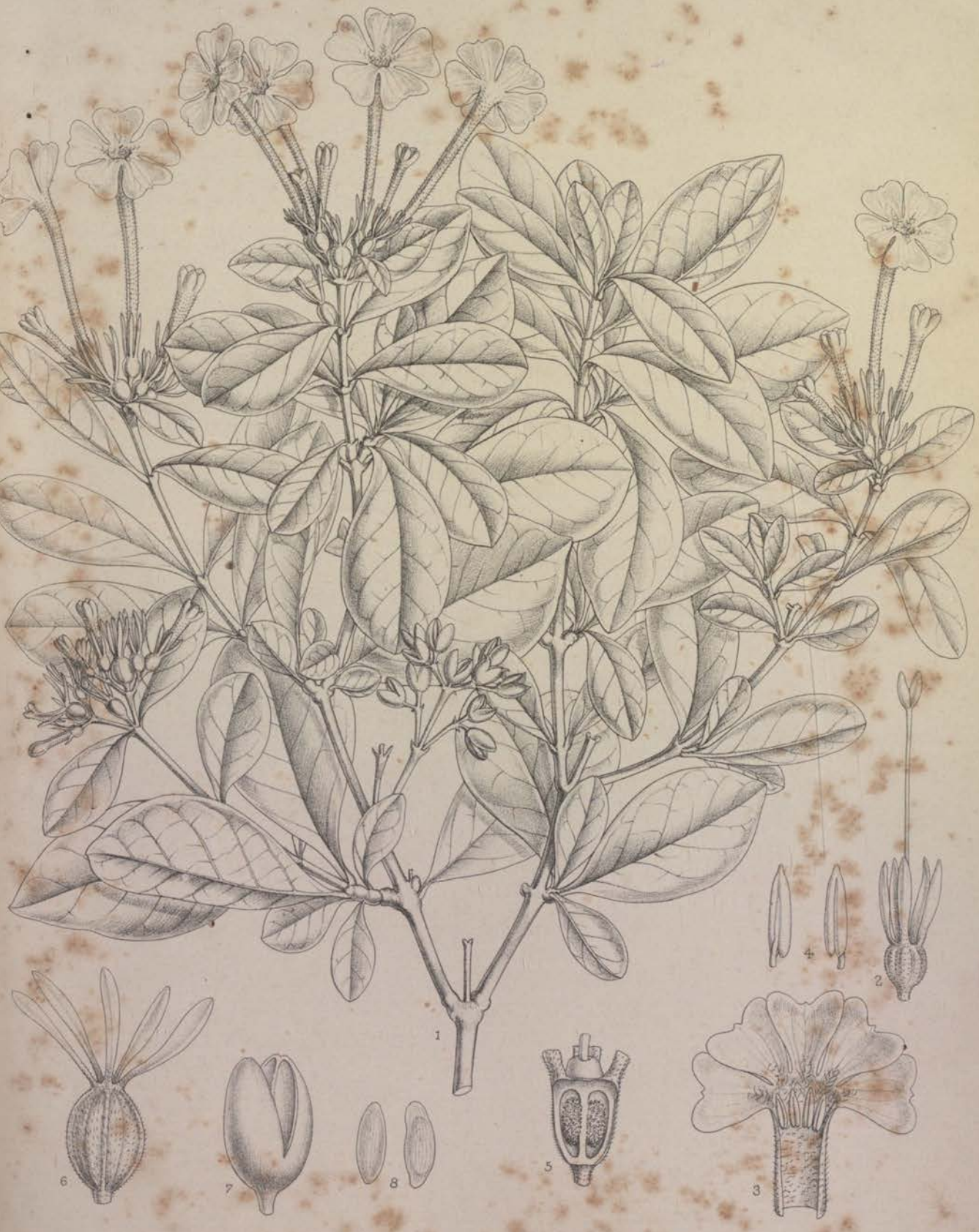
" 5. Ovary in vertical section.

" 6. Young fruit.

" 7. Fruit which has dehisced.

" 8. Seeds.

1 natural size; rest magnified. Drawn from dried specimens.



M. Smith delt. J.N. Fitch lith.

Mussænda capsulifera, *Balf. fil.*

TABULA XXX.

Tab. XXX. Vernonia Cockburniana, Balf. fil. Page 121.

Three branches showing habit. The one to the right is from a plant growing on the limestone plain, and shows the dwarfed character, with small foliage-leaves. The one in the middle, with longer foliage-leaves and flowers, is from a plant growing on the hill-slope. The one on the left shows a small rounded form of foliage-leaf.

Fig. 1. Flower.

" 2. Pappus.

" 3. Portion of andrœcium.

" 4. Style-branches.

" 5. Fruit.

All numbered figures magnified. Drawn from dried specimens.

W. Smith del.

Vernonia Cockburniana, *Balf. fil.*

J.N. Fitch lith.

TABULA XXXI.

Tab. XXXI. Psiadia Schweinfurthii, Balf. fil. Page 124.

Branch with inflorescence showing habit.

Fig. 1. Receptaculum with involucre.

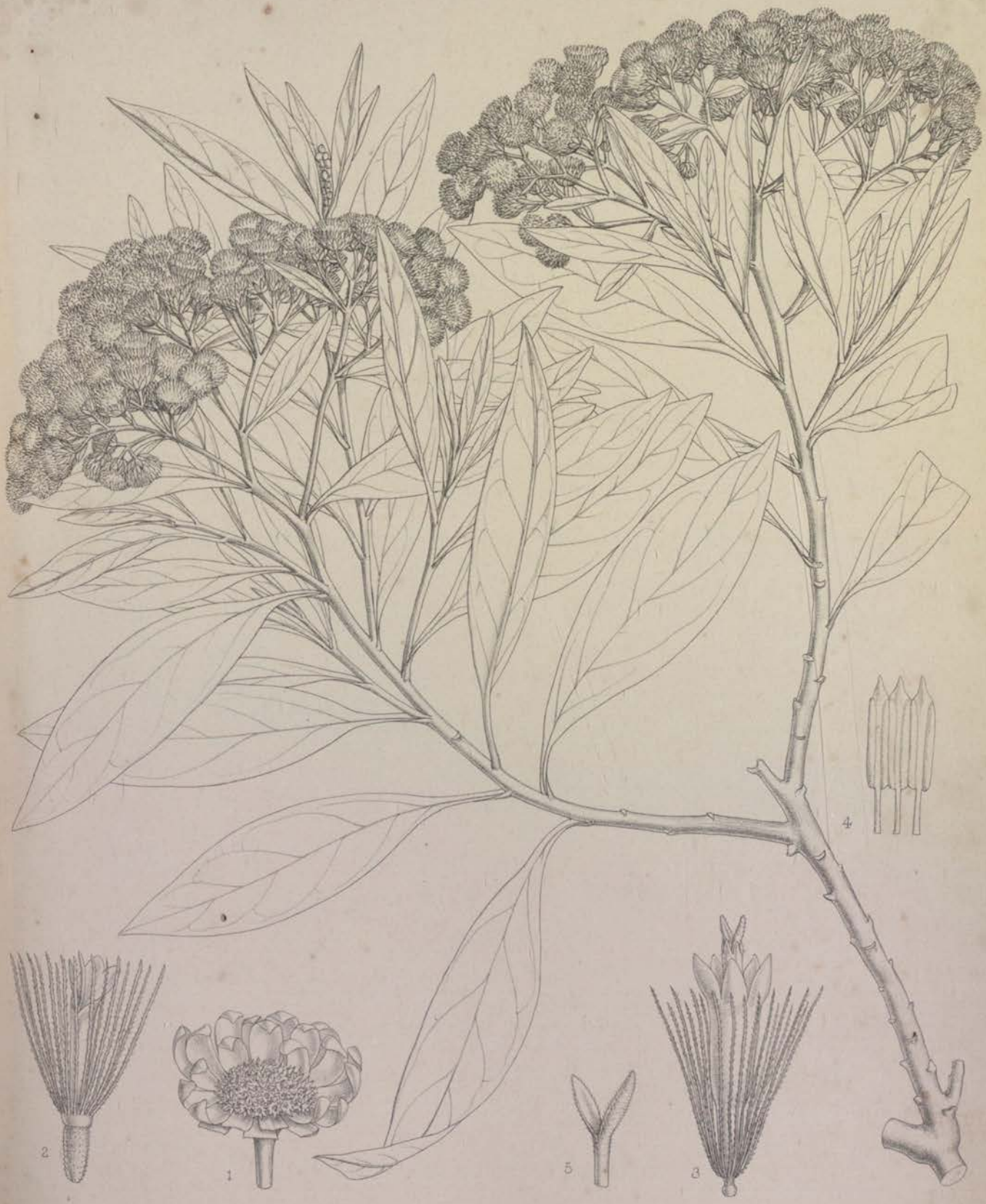
" 2. Pistillate flower

" 3. Hermaphrodite flower.

" 4. Portion of androecium.

" 5. Style-branches.

All numbered figures magnified. Drawn from dried specimens.



M. Smith del.

J. N. Fitch lith.

Psiadia Schweinfurthii, *Balf. fil.*

TABULA XXXII.

Tab. XXXII. **Pluchea aromatica,** Balf. fil. Page 125.

Branch with inflorescence showing habit.

Fig. 1. Phyllary.

" 2. Flower.

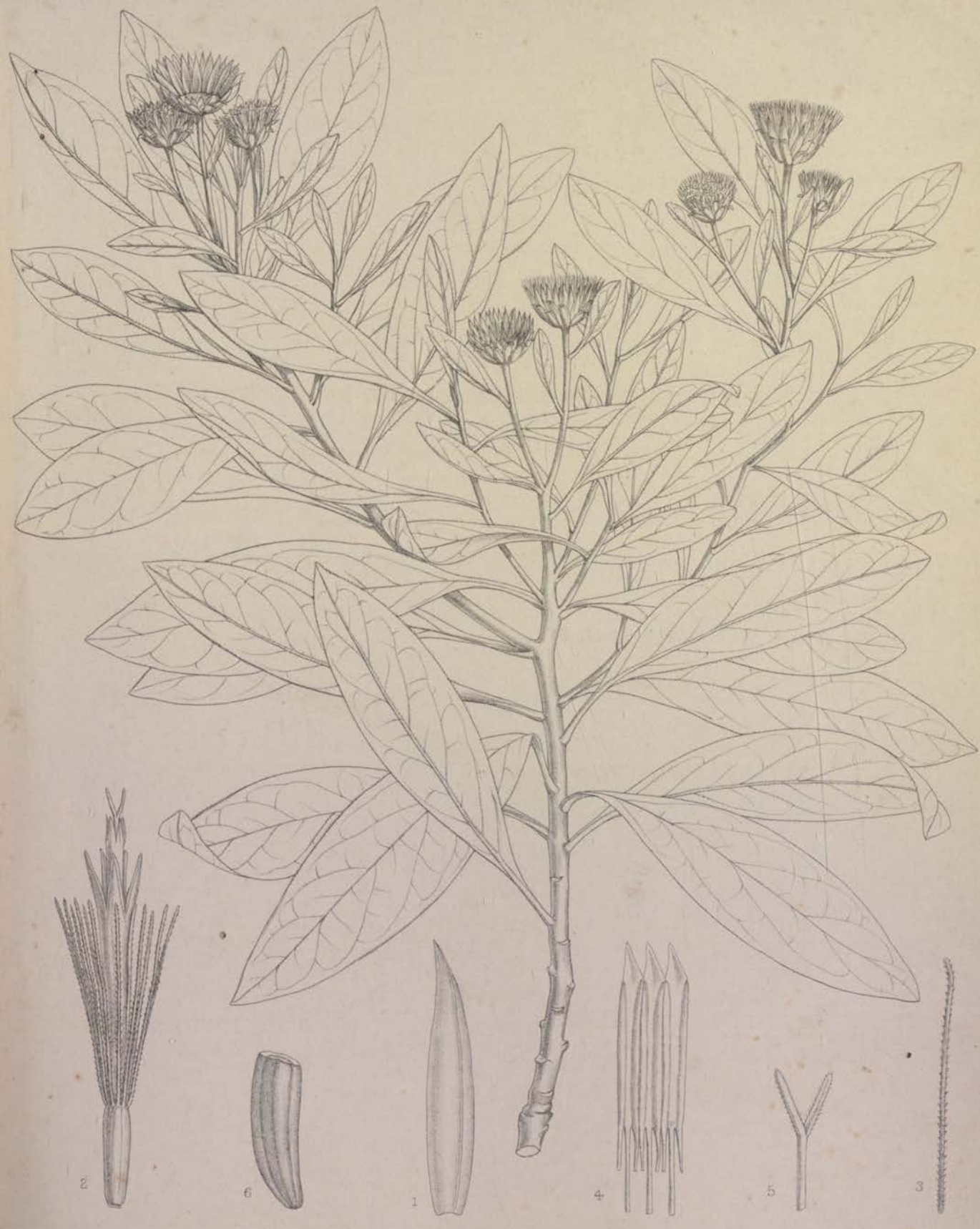
" 3. Pappus.

" 4. Portion of androecium.

" 5. Style-branches.

" 6. Fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith del.

J. N. Fitch lith.

Pluchea aromatica, *Balf. fil.*

TABULA XXXIII.

Tab. XXXIII. Pluchea obovata, Balf. fil. Page 126.

Two branches with inflorescence showing habit.

Fig. 1. Outer phyllary.

" 2. Inner phyllary.

" 3. Pistillate flower.

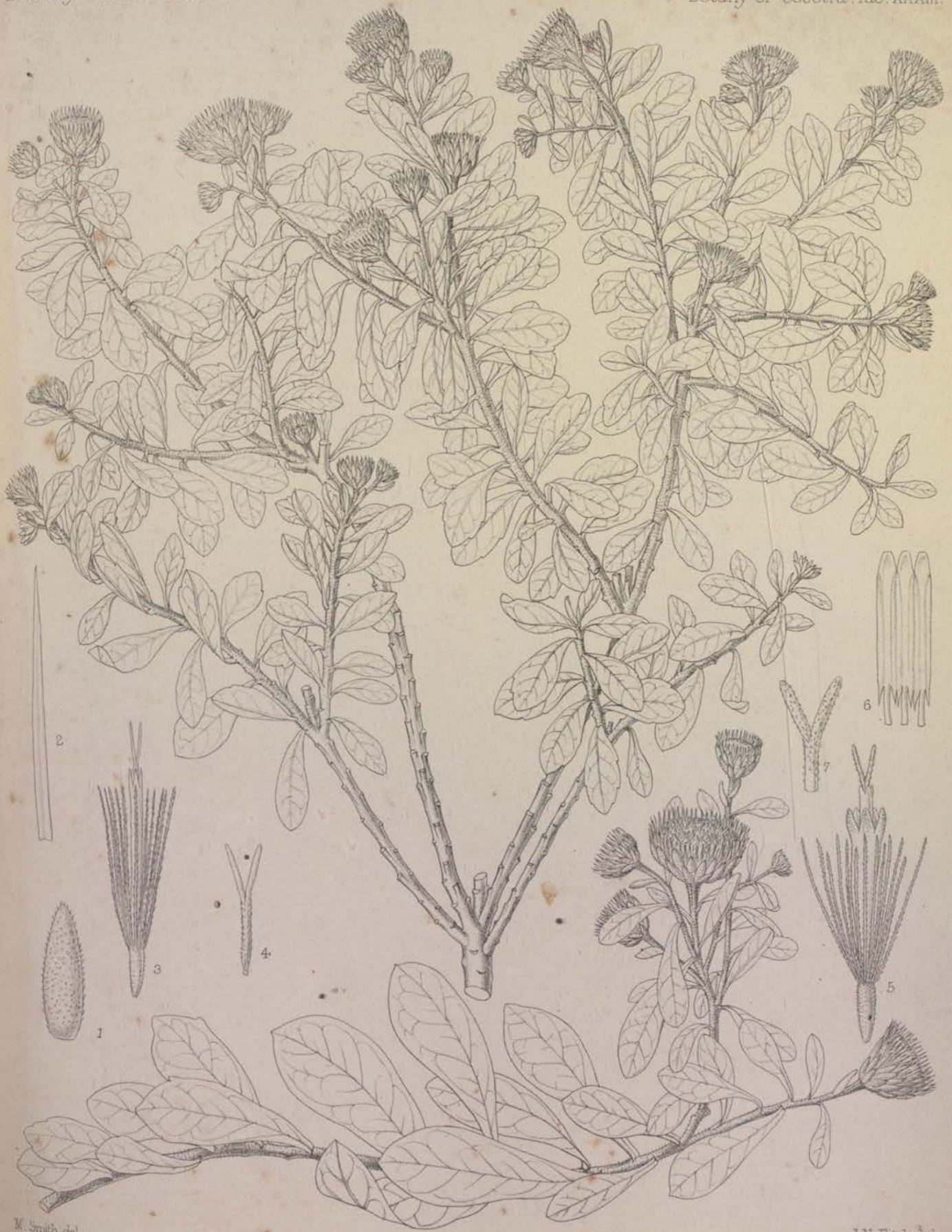
" 4. Style-branches of pistillate flower.

" 5. Hermaphrodite flower.

" 6. Portion of androecium.

" 7. Style-branches of hermaphrodite flower.

All numbered figures magnified. Drawn from dried specimens.



M. Smith del.

J.N. Fitch lith.

Pluchea obovata, *Balf. fil.*

TABULA XXXIV.

Tab. XXXIV, A. Helichrysum rosulatum, Oliv. and Hiern. Page 128.

Plant in flower showing habit.

Fig. 1. Capitulum.

" 2. Phyllaries.

" 3. Flower; the corolla-tube has not been shaded in the lithograph.

" 4. Seta of pappus.

" 5. Anther.

" 6. Style-branches.

All numbered figures magnified. Drawn from dried specimens.

B. Helichrysum aciculare, Balf. fil. Page 131.

Plant in flower showing habit.

Fig. 1. Foliage-leaf.

" 2. Capitulum.

" 3. Receptaculum with phyllaries.

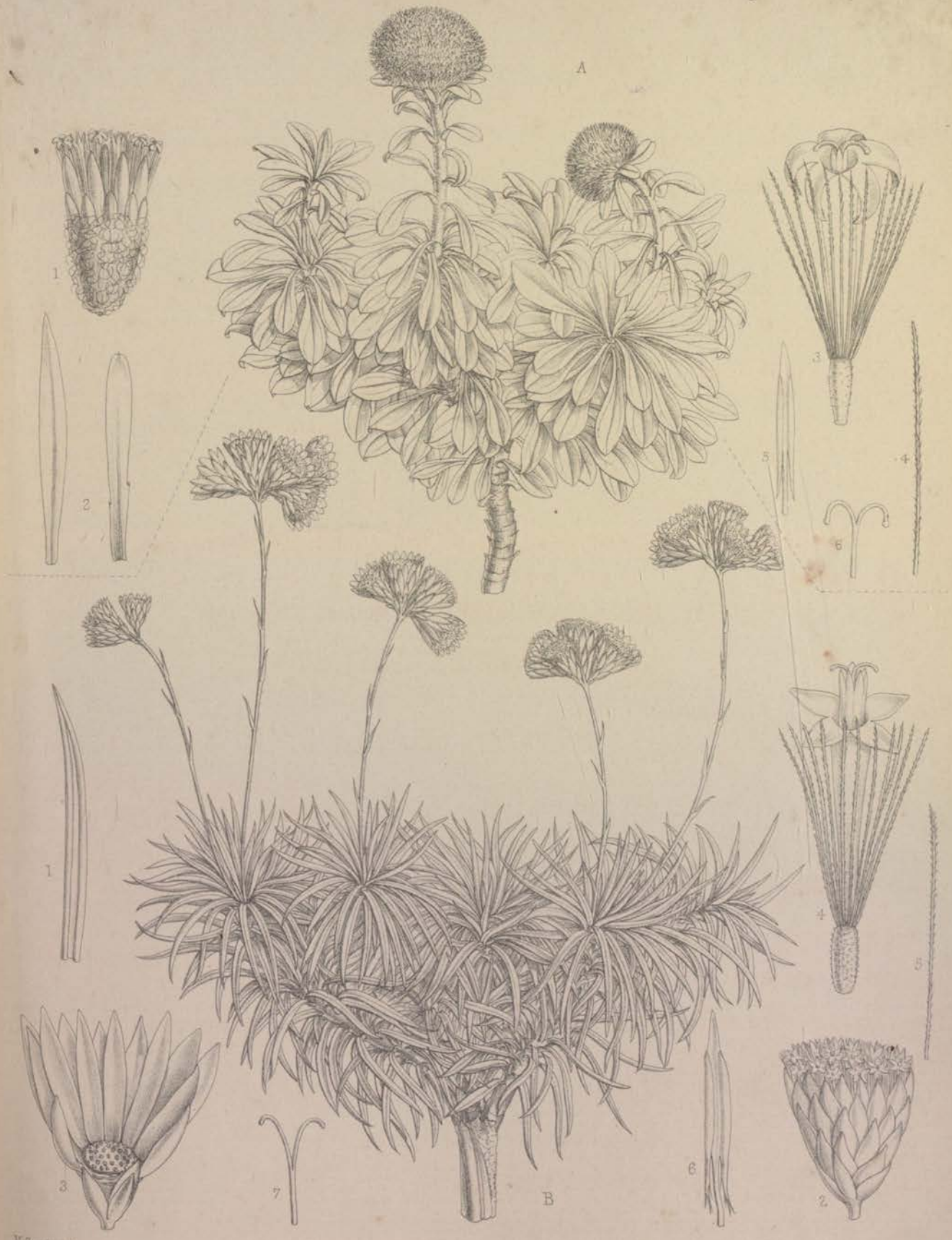
" 4. Flower.

" 5. Seta of pappus.

" 6. Anther.

" 7. Style-branches.

All numbered figures magnified. Drawn from dried specimens.



M. Smith del.

J. N. Fitch lith.

A. Helichrysum rosulatum, *Oliv. & Hiern.*
B. Helichrysum aciculare, *Balf. fil.*

TABULA XXXV.

Tab. XXXV. Helichrysum Nimmoanum, Oliv. and Hiern. Page 131.

Branch with inflorescence showing habit.

Fig. 1. Capitulum.

" 2. Inner phyllary.

" 3. Flower.

" 4. Seta of pappus.

" 5. Portion of androecium.

" 6. Style-branches.

All numbered figures magnified. Drawn from dried specimens.

M. Smith del. J.N. Fitch lith.

Helichrysum Nimmoanum, *Oliv. & Hiern.*

TABULA XXXVI.

Tab. XXXVI. Helichrysum suffruticosum, Balf. fil. Page 132.

Branch with inflorescence showing habit.

Fig. 1. Portion of foliage-leaf-lamina.

" 2. Capitulum.

" 3. Flower.

" 4. Seta of pappus.

" 5. Anther.

" 6. Style-branches.

All numbered figures magnified. Drawn from dried specimens.

M. Smith del.

J.N. Fisch. lith.

Helichrysum suffruticosum, *Balf. fil.*

TABULA XXXVII.

Tab. XXXVII. Helichrysum gracilipes, Oliv. and Hiern. Page 132.

Two forms of the plant are shown; the upper is the genuine and typical form, the lower is the stoloniferous state.

Fig. 1. Phyllary.

" 2. Outer flower.

" 3. Seta of its pappus.

" 4. Anther.

" 5. Style-branches.

" 6. Inner flower.

All numbered figures magnified. Drawn from dried specimens.

M. Smith, del. McFarlane & Erskine Lith^rs Edin^r

Helichrysum gracilipes, *Oliv. & Hiern.*

TABULA XXXVIII.

Tab. XXXVIII. **Pulicaria stephanocarpa**, Balf. fil. Page 135.

Two forms of the plant are shown.

Fig. 1. Receptaculum with phyllaries.

" 2. Phyllary.

" 3. Flower.

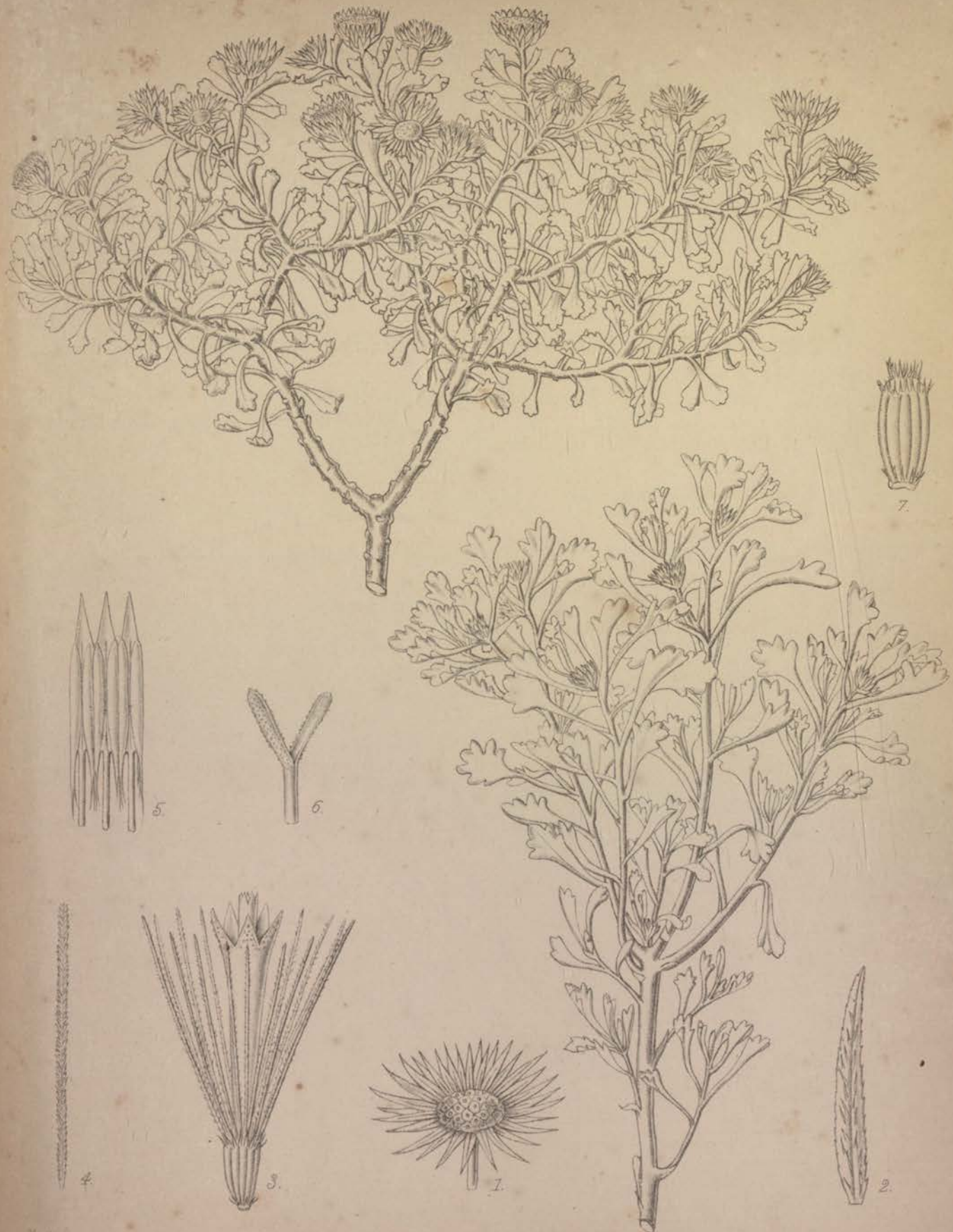
" 4. Seta of pappus.

" 5. Portion of androecium.

" 6. Style-branches.

" 7. Fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

McFarlane & Erskine, Lith^rs Edin^r

Pulicaria stephanocarpa, *Balf. fil.*

TABULA XXXIX.

Tab. XXXIX. **Pulicaria vieræoides,** Balf. fil. Page 137.

Branch with inflorescence showing habit.

Fig. 1. Receptaculum with phyllaries.

" 2. Ray-flower.

" 3. Seta of pappus.

" 4. Disk-flower.

" 5. Portion of andrœcium.

" 6. Style-branches.

" 7. Fruit.

All numbered figures magnified. Drawn from dried specimens.

M. Smith del.t

Pulicaria vieræoides, *Balf fil.*

J.N. Fitch lith.

TABULA XL.

Tab. XL. Senecio Scotti, Balf. fil. Page 140.

Branch with inflorescence showing habit.

Fig. 1. Flower.

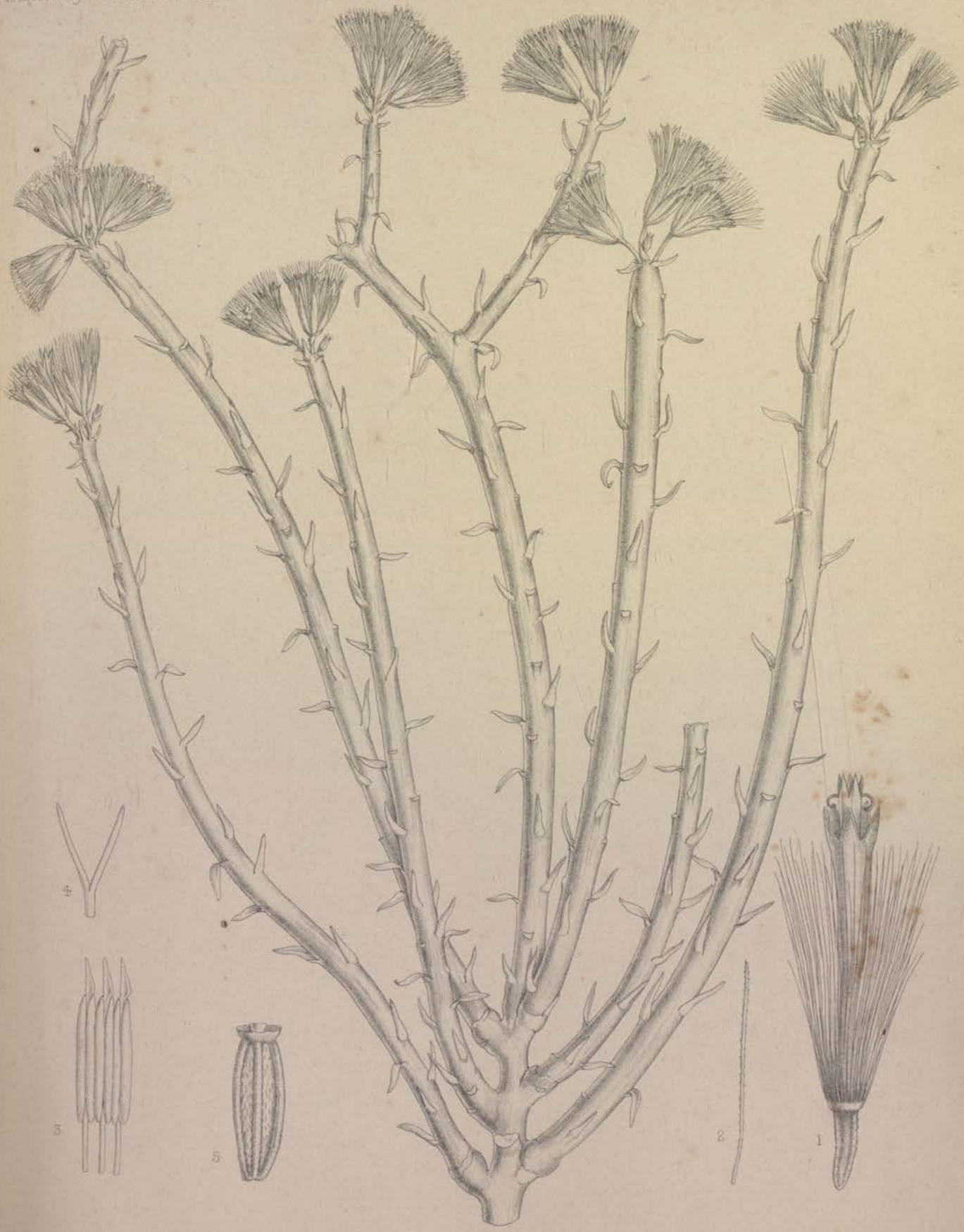
" 2. Seta of pappus.

" 3. Portion of androœcium.

" 4. Style-branches.

" 5. Fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith del.

J. N. Fitch lith.

Senecio Scotti, *Balf. fil.*

TABULA XLI.

Tab. XLI. **Euryops socotranus**, Balf. fil. Page 141.

Branch with inflorescence showing habit.

Fig. 1. Receptaculum with phyllaries.

" 2. Ray-flower.

" 3. Setae of pappus.

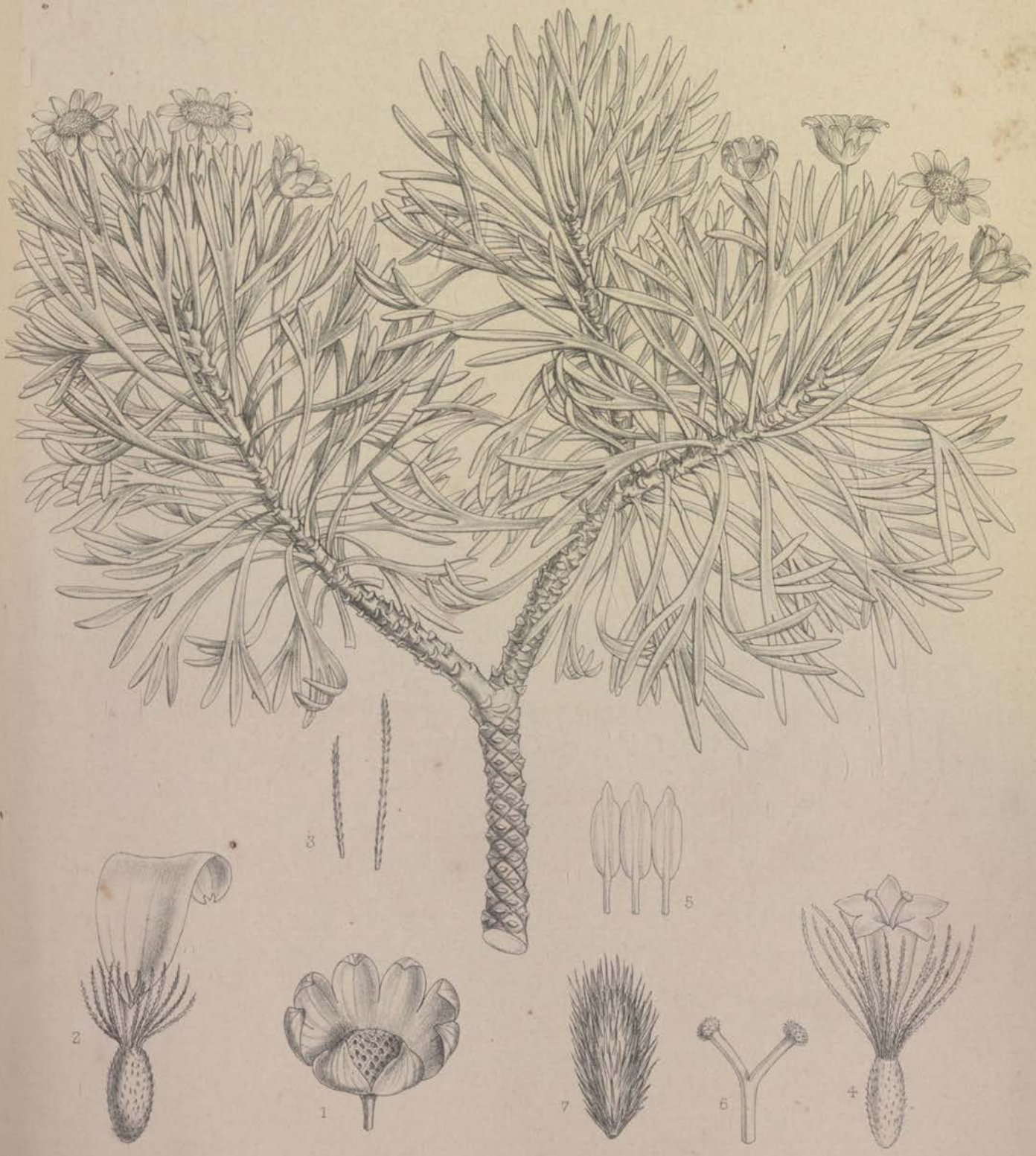
" 4. Disk-flower.

" 5. Portion of andrœcium.

" 6. Style-branches.

" 7. Fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith. del.

J.N. Fitch. lith.

Euryops socotranus, *Balf. fil.*

TABULA XLII.

XLII. Dicoma cana, Balf. fil. Page 142.

Branch with inflorescence showing habit.

Fig. 1. Apex of a branch.

" 2. Flower.

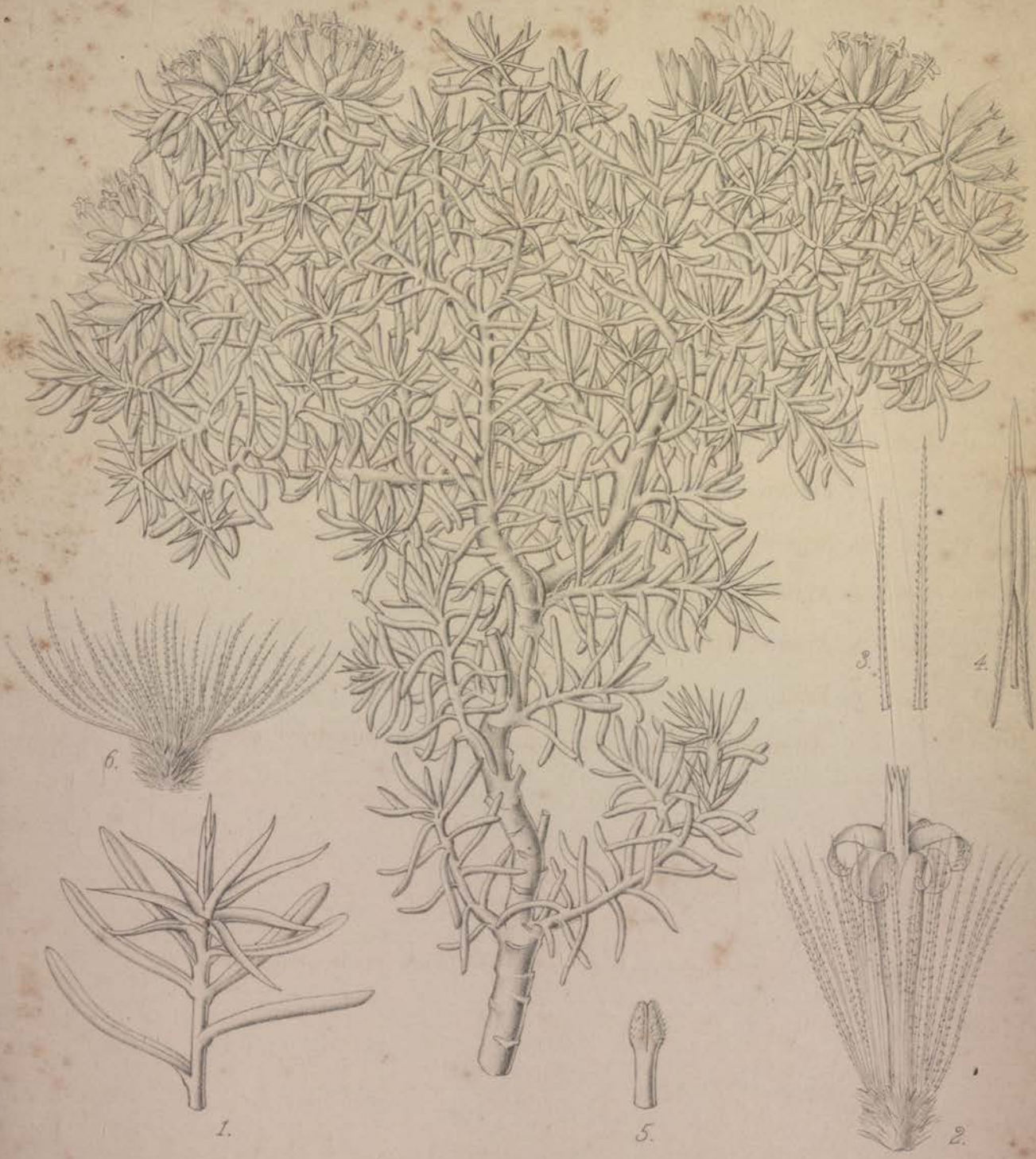
" 3. Setæ of pappus.

" 4. Anther.

" 5. Apex of style.

" 6. Fruit.

All numbered figures magnified. Drawn from dried specimens.



Dicoma cana. *Balf. fil.*

TABULA XLIII.

Tab. XLIII. **Prenanthes amabilis**, Balf. fil. Page 145.

Plant in flower showing habit.

Fig. 1. Flower.

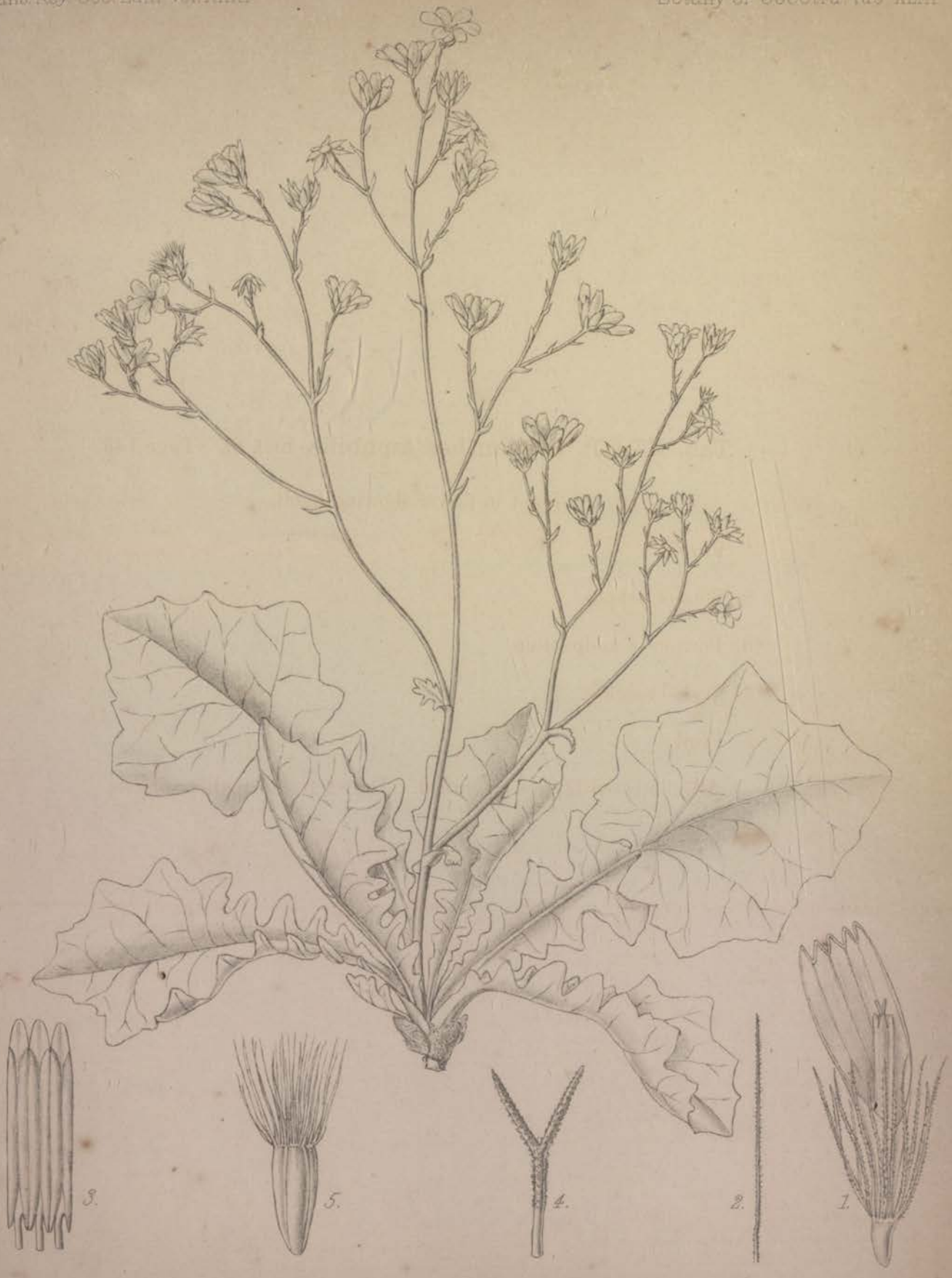
" 2. Seta of pappus.

" 3. Portion of andrœcium.

" 4. Style-branches.

" 5. Fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del. McFarlane & Erskine, Lith^rs Edin^r

Prenanthes amabilis, *Balf. fil.*

TABULA XLIV.

Tab. XLIV. **Vogelia pendula**, Balf. fil. Page 150.

Branch with flowers showing habit.

Fig. 1. Bracteoles at base of flower-pedicel.

" 2. Calyx.

" 3. Stamen.

" 4. Anther, back and face views.

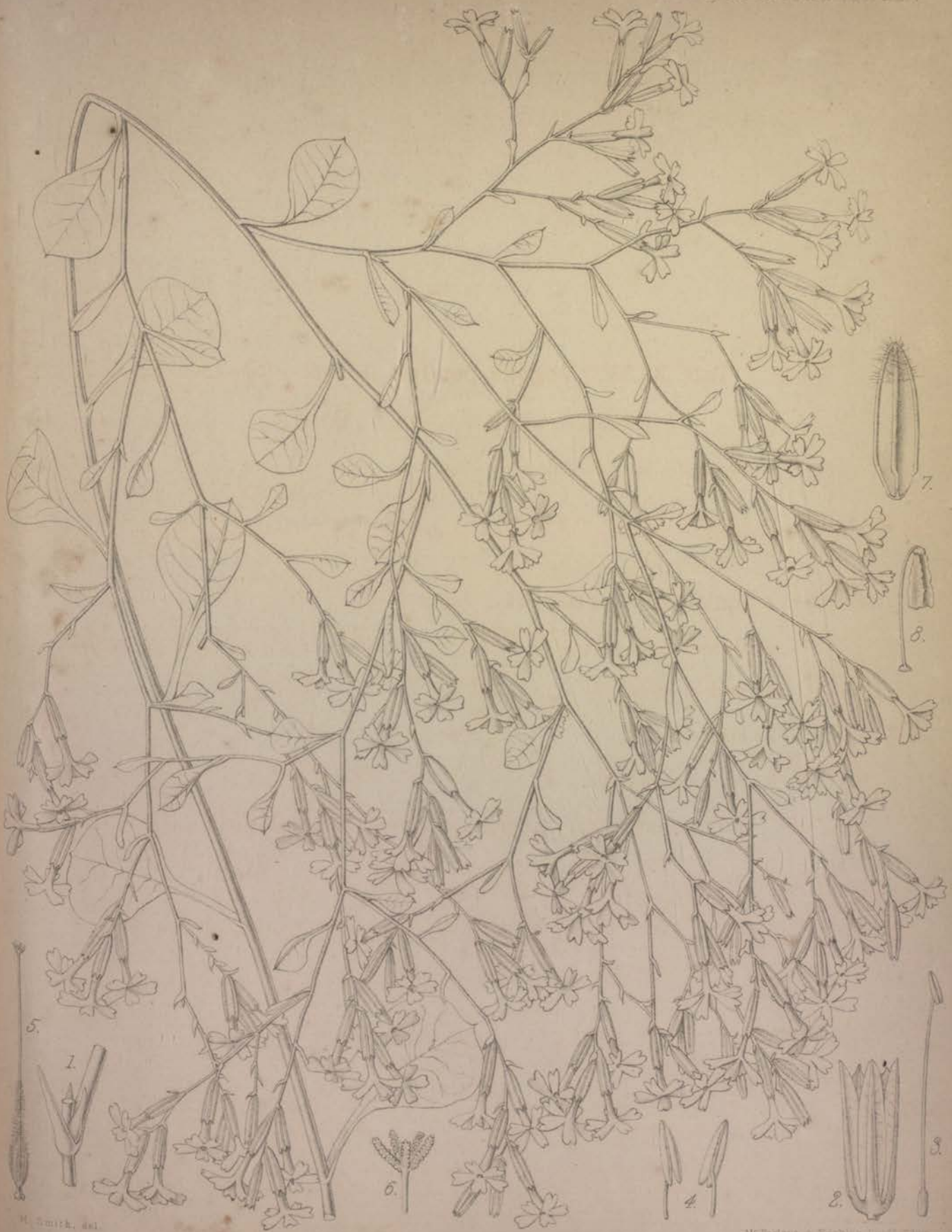
" 5. Gynæceum.

" 6. Style-branches.

" 7. Fruit-valve.

" 8. Seed on funiculus.

All numbered figures magnified. Drawn from dried specimens.



Vogelia pendula. *Balf. fil.*

TABULA XLV.

Tab. XLV. Jasminum rotundifolium, Balf. fil. Page 155.

Portions of two branches showing flowers and fruit.

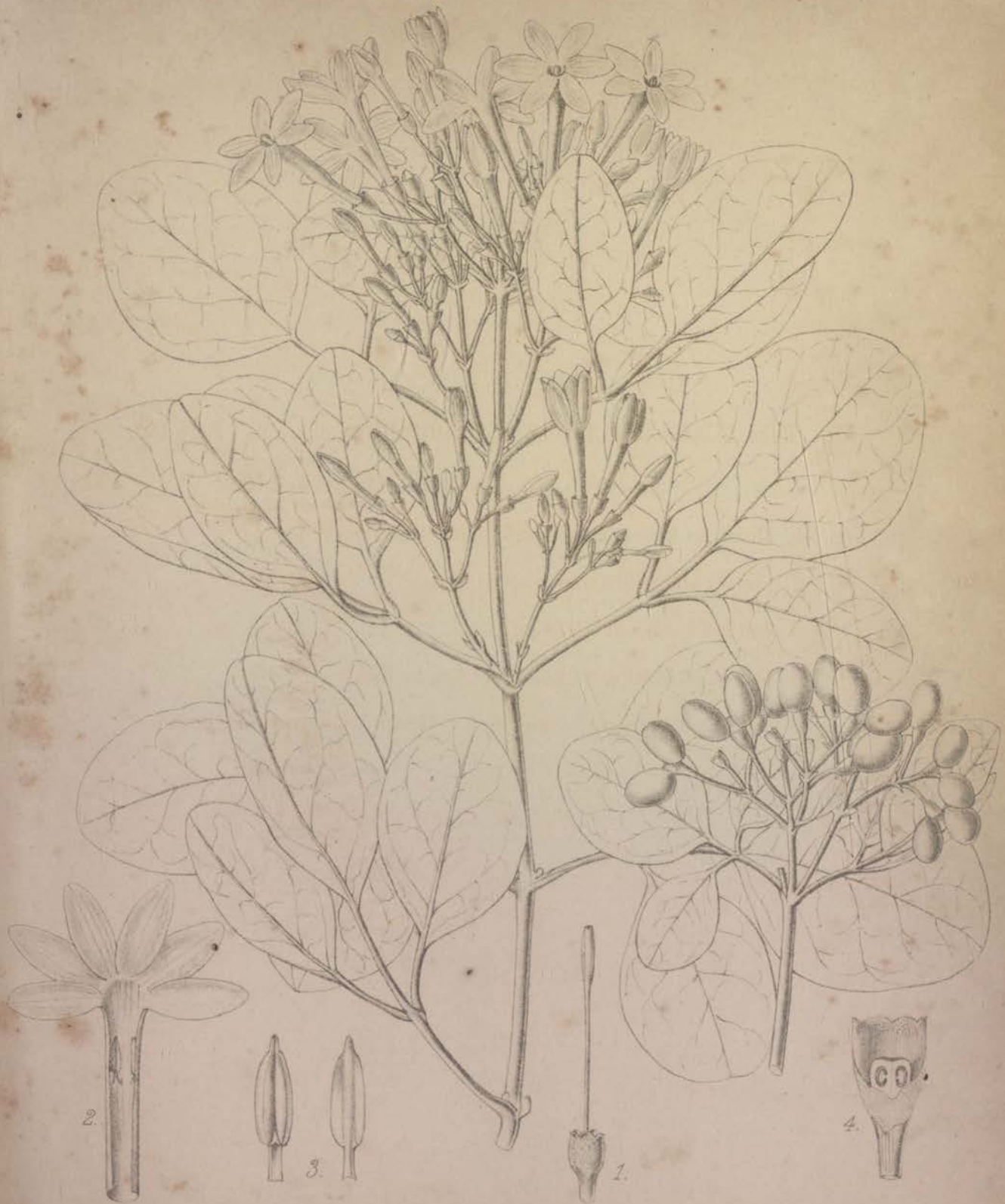
Fig. 1. Dissected flower, corolla and androecium removed.

" 2. Corolla and androecium opened out.

" 3. Anther, back and face views.

" 4. Ovary enclosed in calyx, in vertical section.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

Mc Farlane & Erskine, Lith^rs Edin^r

Jasminum rotundifolium, *Balf. fil.*

TABULA XLVI.

Tab. XLVI. Socotora aphylla, Balf. fil. Page 159.

Fig. 1. Branch with flowers.

" 2. Branch with fruit.

" 3. Flower-bud.

" 4. Flower expanded.

" 5. Dissected flower, showing opened corolla with corona and andrœcium raised from its position within the calyx and around the gynæceum, which is represented with the appendages attached.

" 6. One of the appendages removed from stigma.

" 7. Stamen, back and face views.

" 8. Young fruit with calyx.

" 9. Seed.

1 and 2 natural size; rest magnified. Drawn from dried specimens.

J.N. Fitch lith.

Socotora aphylla, *Balf. fil.*

J.N. Fitch imp.

TABULA XLVII.

Tab. XLVII. Ectadiopsis volubilis, Balf. fil. Page 163.

Fig. 1. Two branches showing habit, one with flowers the other with fruit.

" 2. Unexpanded flower.

" 3. Expanded flower.

" 4. Dissected flower, showing opened corolla with corona (the stamens being removed) raised from the position within the calyx and around gynæceum, which is represented with the appendiculæ attached.

" 5. Dissected flower, the calyx removed and a portion of corolla, so as to show corona-scales, insertion of stamens, stigma, and appendiculæ.

" 6. Stigma with appendiculæ.

" 7. Seed with aril.

1 natural size; rest magnified. Drawn from dried specimens.

J. N. Fitch. del. et lith. Fitch imp.

Ectadiopsis volubilis, *Balf. fil.*

TABULA XLVIII.

Tab. XLVIII. Mitolepis intricata, Balf. fil. Page 166.

Fig. 1. Branch with flowers.

" 2. Branch with larger foliage-leaves and fruit.

" 3. Flower-bud half opened.

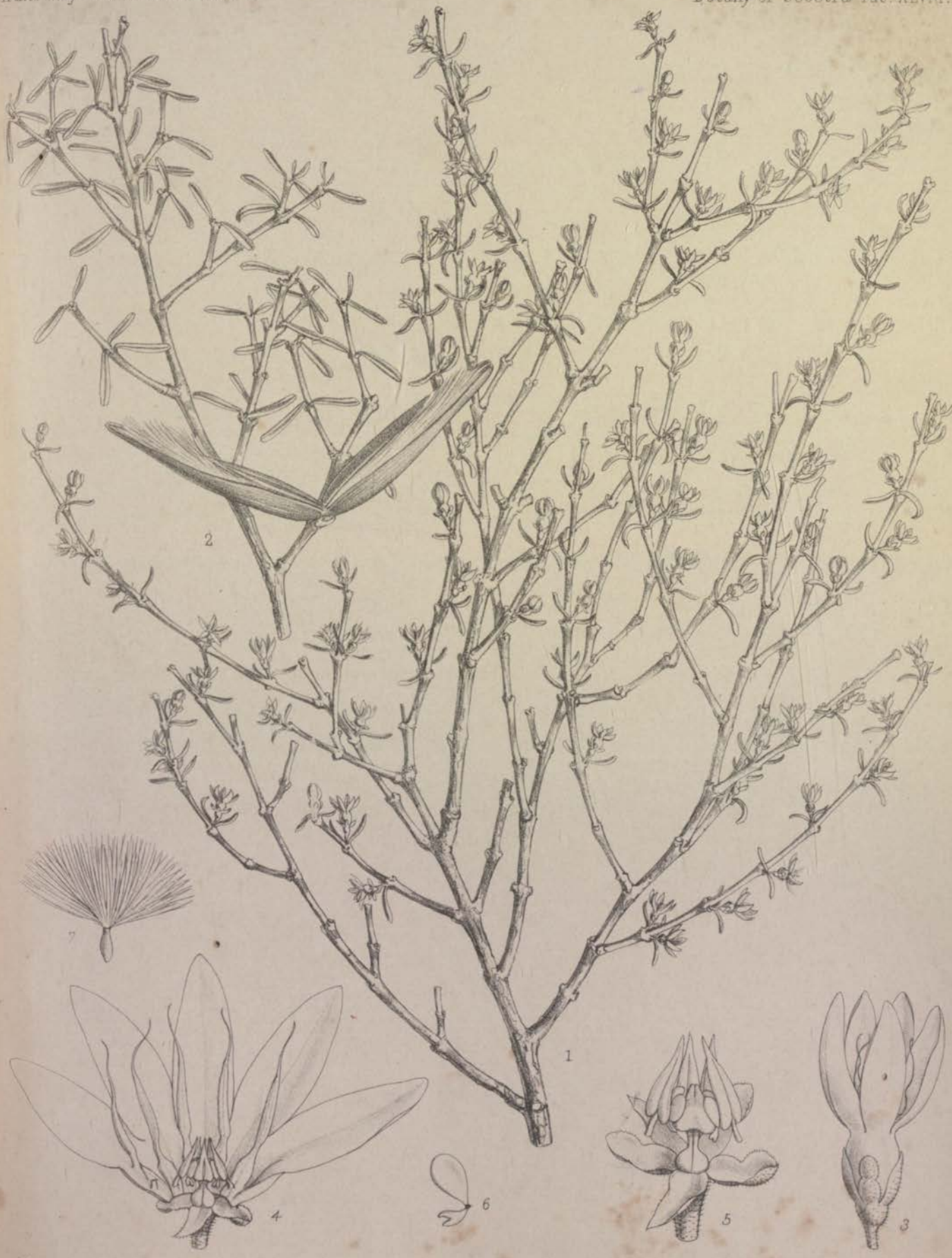
" 4. Dissected flower, showing corolla opened with corona and stamens and partially removed from around gynæceum.

" 5. Dissected flower, the corolla with corona and one stamen removed.

" 6. Corpuscle and appendage.

" 7. Seed with aril.

1 and 2 natural size; rest magnified. Drawn from dried specimens by Mr J. N. Fitch.



J. N. Fitch lith.

Mitolepis intricata, *Balf. fil*

J. N. Fitch imp.

TABULA XLIX.

Tab. XLIX. **Cochlanthus socotranus**, Balf. fil. Page 167.

Fig. 1. Branch with inflorescence.

" 2. Branch with fruit.

" 3. Unexpanded flower.

" 4. Expanded flower.

" 5. Dissected flower, showing corolla opened with corona attached and raised from its position within the calyx and around the androecium and gynæceum.

" 6. Portion of corona surrounding androecium and gynæceum.

" 7. Gynæceum with appendiculæ on stigma, one anther shown bent back, rest being removed.

" 8. Seed with aril.

1 and 2 natural size; rest magnified. Drawn from dried and spirit-specimens.

J.N. Fitch del. et lith.

Fitch imp.

Cochlanthus socotranus, *Balf. fil.*

TABULA L.

Tab. L. Secamone socotrana, Balf. fil. Page 167.

Fig. 1. Branch showing habit and with flowers.

" 2. Branch with fruits.

" 3. Flower-bud.

" 4. Flower expanded.

" 5. Dissected flower; two sepals are removed and the opened out corolla is raised up from its line of insertion; the stamens are cut off near their base and are left surrounding the gynæceum.

" 6. Portion of a dissected flower showing the scales upon the corolla, insertion of stamens, and the corona-scales.

" 7. Stamen isolated; back and face views. The back view shows the corona scale attached. The pollinia are not represented.

" 8. Seed with aril.

1 and 2 natural size; rest magnified. Drawn from dried specimens.

J.N. Fitch del. et lith.

Secamone socotrana, *Balf. fil.*

J.N. Fitch imp.

TABULA LI.

Tab. LI. Vincetoxicum linifolium, Balf. fil. Page 169.

Fig. 1. Branches with flowers, showing habit.

" 2. Branches with fruit.

" 3. Flower-bud.

" 4. Flower expanded.

" 5. Gynostemium and corona from the side.

" 6. Gynostemium and corona from above.

" 7. Pollinia.

" 8. Seed with aril.

All numbered figures magnified. Drawn from dried and spirit-specimens.

J. Fitch. del. et lith.

Vincetoxicum linifolium, *Balf. fil.*

J.N. Fitch imp.

TÁBULA LII.

Tab. LII. Marsdenia robusta, Balf. fil. Page 171

Fig. 1. Branch with flowers and fruit showing habit.

" 2. Unexpanded flower.

" 3. Expanded flower.

" 4. Dissected flower; calyx removed and corolla opened and partially removed.

" 5. Androecium with corona-scales surrounding gynæceum.

" 6. Androecium and gynæceum seen from above; to the left and above an anther shown bent back.

" 7. Gynæceum with pollinia.

" 8. Pollinia.

" 9. Seed with aril.

1 natural size; rest magnified. Drawn from dried specimens.

J.N. Fitch del. et lith.

Marsdenia robusta, *Balf. fil.*

J.N. Fitch imp.

TABULA LIII.

Tab. LIII. **Exacum cæruleum**, Balf. fil. Page 174.

Branch with flowers showing habit.

Fig. 1. Flower-bud.

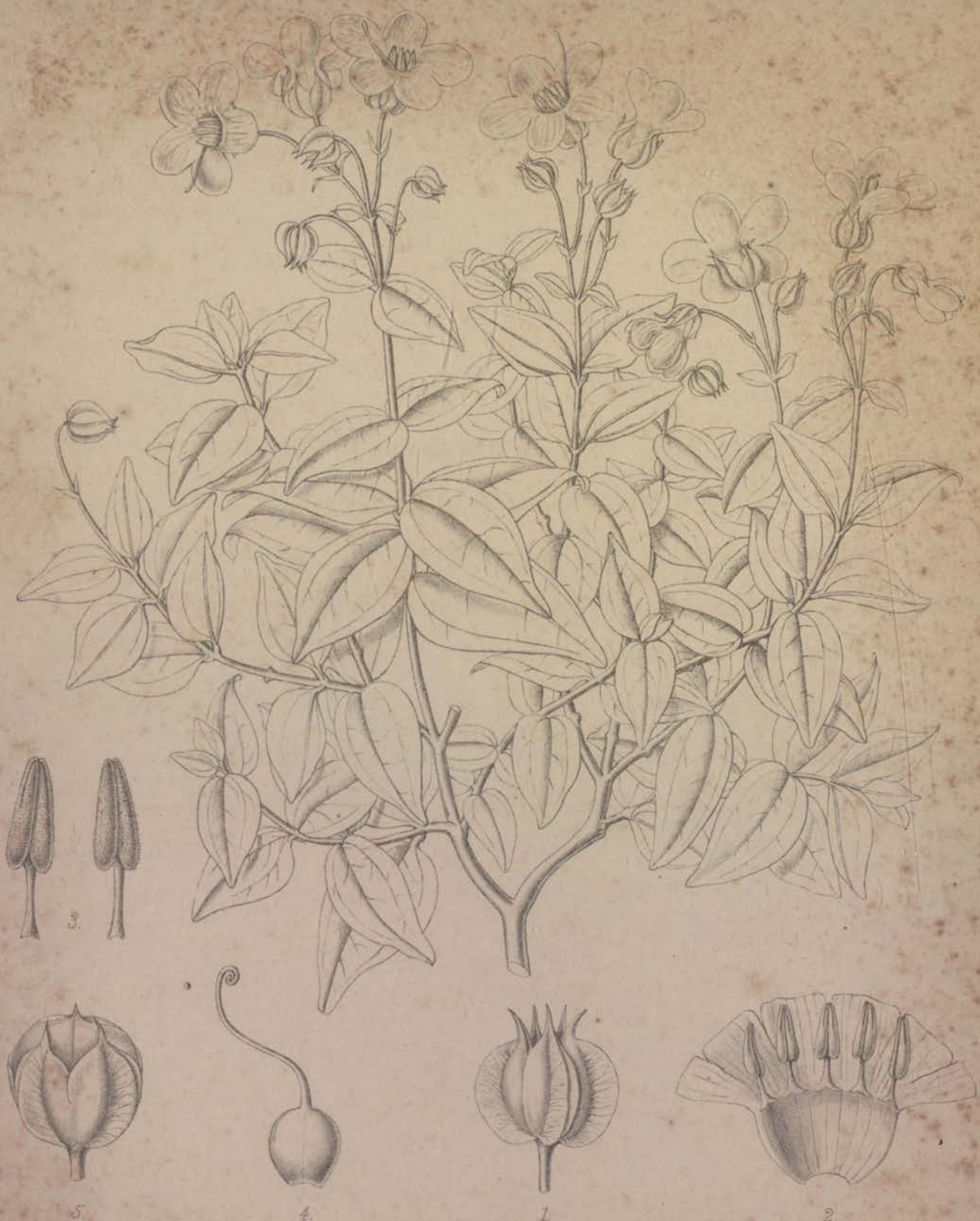
" 2. Corolla and andrœcium opened out, the corolla lobes cut short.

" 3. Stamen, back and face views.

" 4. Gynæceum.

" 5. Young fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

M. Farlane & Erskine, lith.rs Edinr.

Exacum coeruleum, *Balf. fil.*

TABULA LIV.

Tab. LIV, A. **Heliotropium dentatum**, Balf. fil. Page 179.

Plant in flower.

Fig. 1. Calyx enclosing gynæceum.

" 2. Corolla.

" 3. Corolla and andrœcium opened out.

" 4. Gynæceum.

" 5. Fruit.

B. **Heliotropium nigricans**, Balf. fil. Page 183.

Branch with flowers, showing habit.

Fig. 1. Foliage-leaves.

" 2. Calyx.

" 3. Corolla.

" 4. Corolla and andrœcium opened out.

" 5. Anther.

" 6. Gynæceum.

" 7. Fruit.

All numbered figures in both A and B magnified. Drawn from dried specimens.

M. Smith, del. Mc Farlane & Erskine, Lith.rs Edin.r

A. Heliotropium dentatum, *Balf. fil.*
B. Heliotropium nigricans, *Balf. fil.*

TABULA LV.

Tab. LV. Trichodesma Scotti, Balf. fil. Page 184.

Terminal portion of a branch shown with small leaves; also an inflorescence.

Fig. 1. Flower dissected to show andrœcium.

" 2. Stamen.

" 3. Gynæceum.

" 4. Mericarp.

All numbered figures magnified. Drawn from dried specimens.

Trichodesma Scotti, *Balf. fil.*

TABULA LVI.

Tab. LVI. Cystistemon socotranus, Balf. fil. Page 187.

Portions of two branches shown.

Fig. 1. Calyx enclosing gynæceum.

" 2. Corolla.

" 3. Flower dissected to show androecium.

" 4. Stamen.

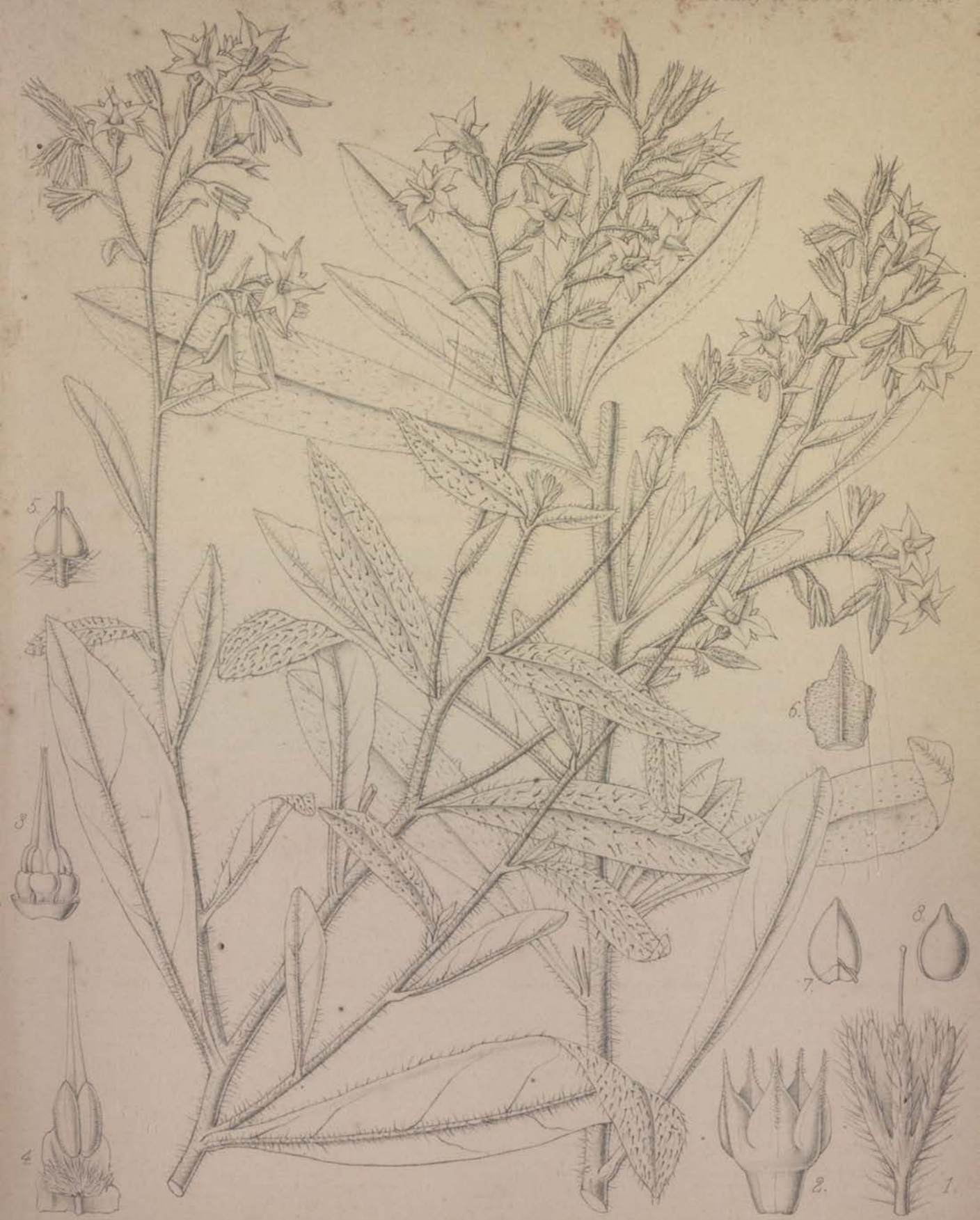
" 5. Ovary on flower-pedicel.

" 6. Mericarp.

" 7. Seed.

" 8. Embryo.

All numbered figures magnified. Drawn from dried specimens.



Cystistemon socotranus, *Balf. fil.*

TABULA LVII.

Tab. LVII. Porana obtusa, Balf. fil. Page 192.

Branch with inflorescence.

Fig. 1. Flower expanded.

" 2. Dissected flower, corolla and andrœcium removed.

" 3. Corolla and andrœcium opened out.

" 4. Petal.

" 5. Gynæceum on summit of flower-pedicel.

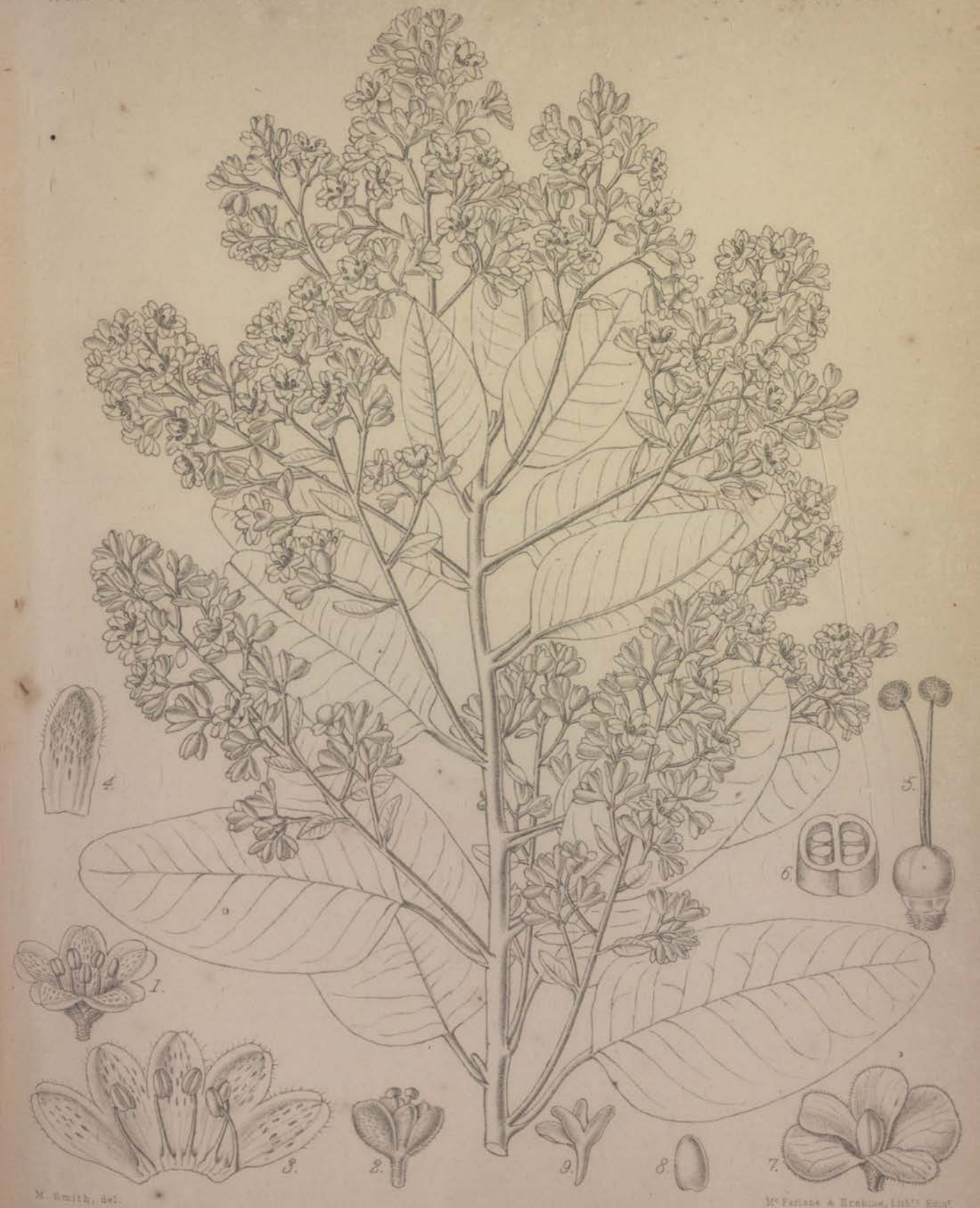
" 6. Ovary in transverse section.

" 7. Fruit enclosed by calyx.

" 8. Seed.

" 9. Embryo.

All numbered figures magnified. Drawn from dried specimens.



Porana obtusa. *Balf. fil.*

TABULA LVIII.

Tab. LVIII. Breweria fastigiata, Balf. fil. Page 194.

Branch with flowers, showing habit.

Fig. 1. Flower expanded.

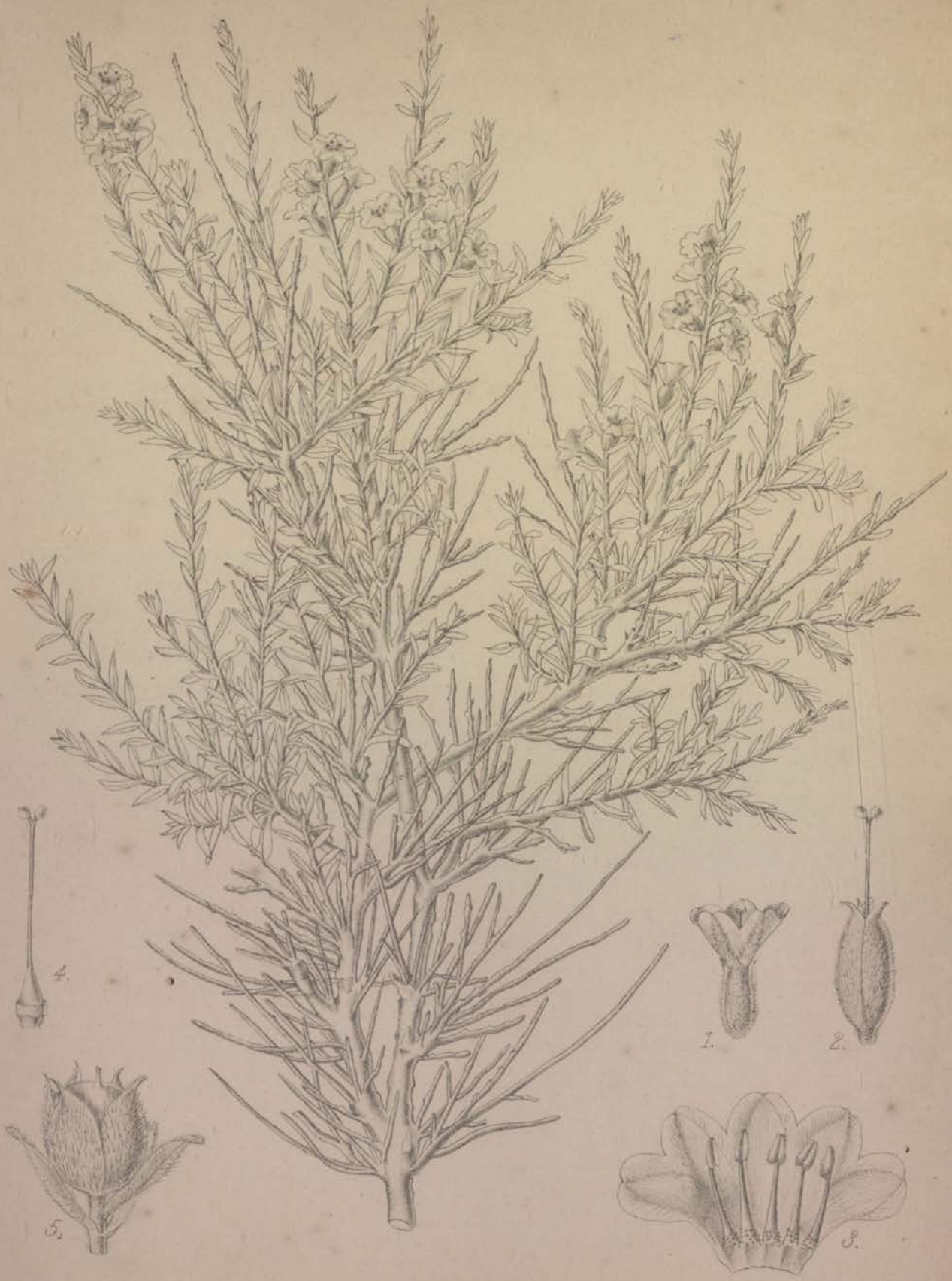
" 2. Dissected flower corolla and andrœcium removed.

" 3. Corolla and andrœcium opened out.

" 4. Gynæceum.

" 5. Young fruit enclosed by calyx—there should not be so many bracteoles on the pedicel.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

M.cFarlane & Erskine, Lith.rs Edinr.

Breweria fastigiata, *Balf fil.*

TABULA LIX.

LIX. Withania Riebeckii, Schweinf. Page 198.

Fig. 1. Branch with flowers showing habit; one large foliage-leaf also shown.

" 2. Flower expanded, lateral view.

" 3. Flower expanded, seen from above.

" 4. Corolla and androecium opened out.

" 5. Stamen.

" 6. Gynæceum.

" 7. Calyx enclosing young fruit.

" 8. Fruit.

" 9. Seed.

All numbered figures magnified. Drawn from dried specimens.

M. Smith, del.

Withania Riebeckii, *Schweinf.*

TABULA LX.

Tab. LX. Camptoloma villosa, Balf. fil. Page 203.

Branch—nearly whole plant—with flowers, showing habit.

Fig. 1. Bract.

" 2. Flower.

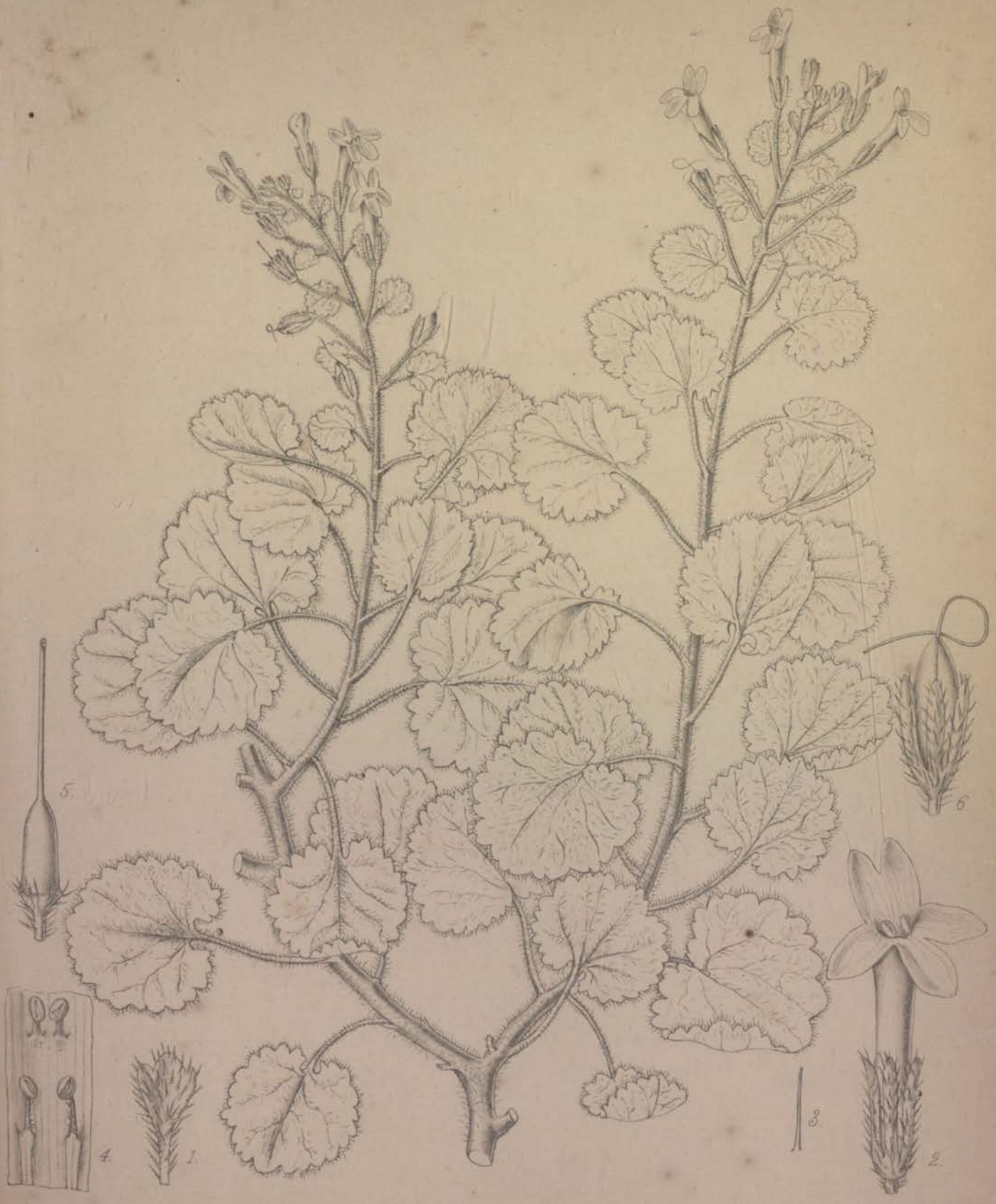
" 3. Hair from calyx.

" 4. Portion of corolla-tube with androecium.

" 5. Gynæceum on summit of flower-pedicel.

" 6. Fruit enclosed by calyx.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

Mc Farlane & Erskine Lith.rs Edinr.

Camptoloma villosa, *Balf. fil.*

TABULA LXI.

Tab. LXI. Campylanthus spinosus, Balf. fil. Page 203.

Two branches; one with flowers, the other with fruit.

Fig. 1. Foliage-leaf.

" 2. Flower in axil of bract.

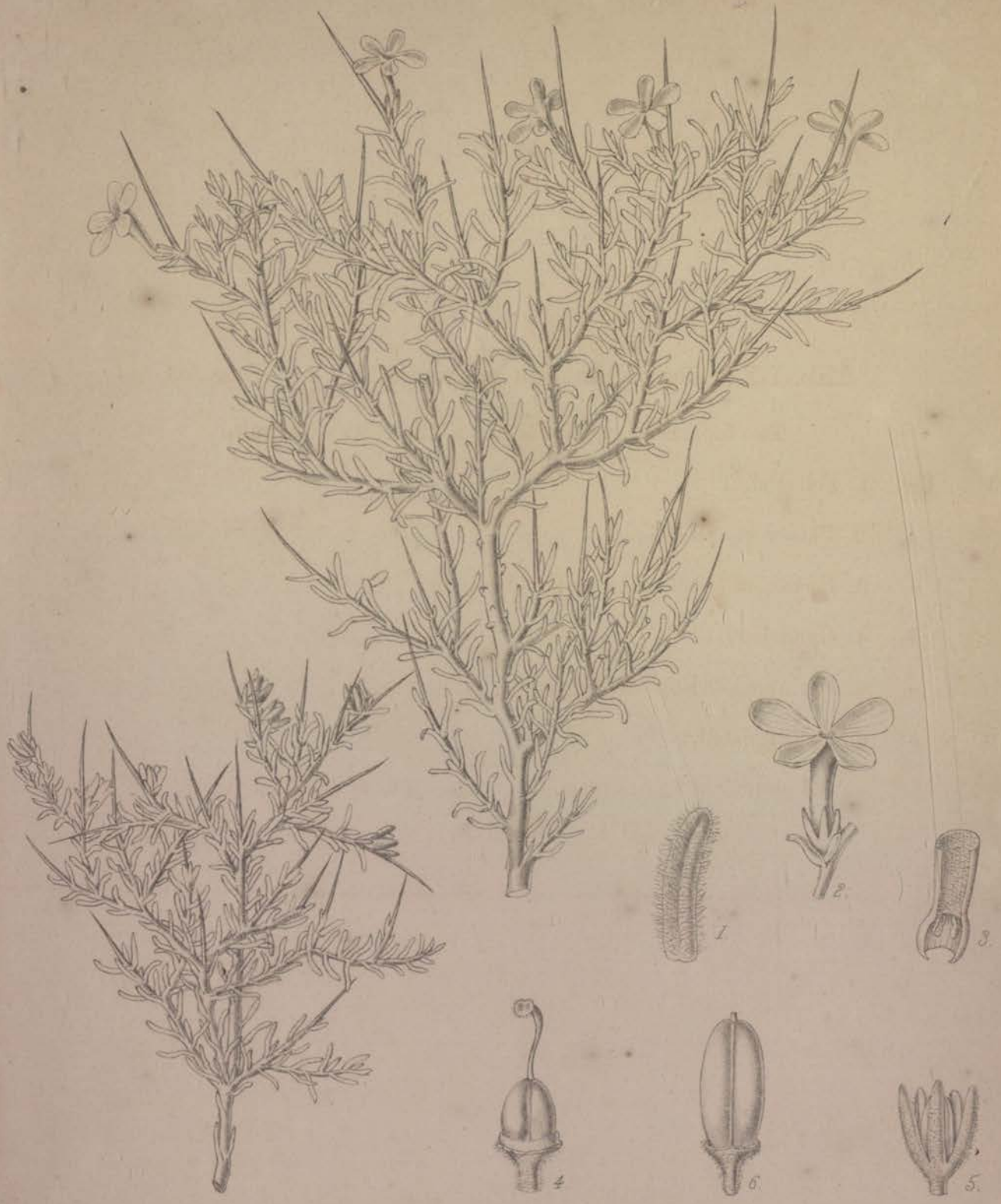
" 3. Portion of corolla-tube with androecium.

" 4. Gynæceum.

" 5. Fruit enclosed by calyx.

" 6. Fruit isolated.

All numbered figures magnified. Drawn from dried specimens.



M. Smith. del.

Mc Farlane & Erskine Lith^rs Edin^r

Campylanthus spinosus, *Balf fil.*

TABULA LXII.

Tab. LXII. Graderia fruticosa, Balf. fil. Page 205.

Two branches with flower and fruit showing habit.

Fig. 1. Foliage-leaf.

" 2. Gynæceum enclosed by calyx.

" 3. Portion of corolla-tube with andrœcium.

" 4. Stamen.

" 5. Fruit.

All numbered figures magnified. Drawn from dried specimens.

M. Smith. del.

M'Farlane & Erskine Lith. Edin.

Graderia fruticosa, *Balf. fil.*

TABULA LXIII.

Tab. LXIII. Xylocalyx asper, Balf. fil. Page 206.

Two forms of the plant are shown; on the left is the virgately-branched form, on the right the dwarf form.

Fig. 1. Foliage-leaf.

" 2. Calyx enclosing gynæceum; the two bracteoles are seen attached to the pedicel.

" 3. Portion of corolla with androecium.

" 4. Stamen.

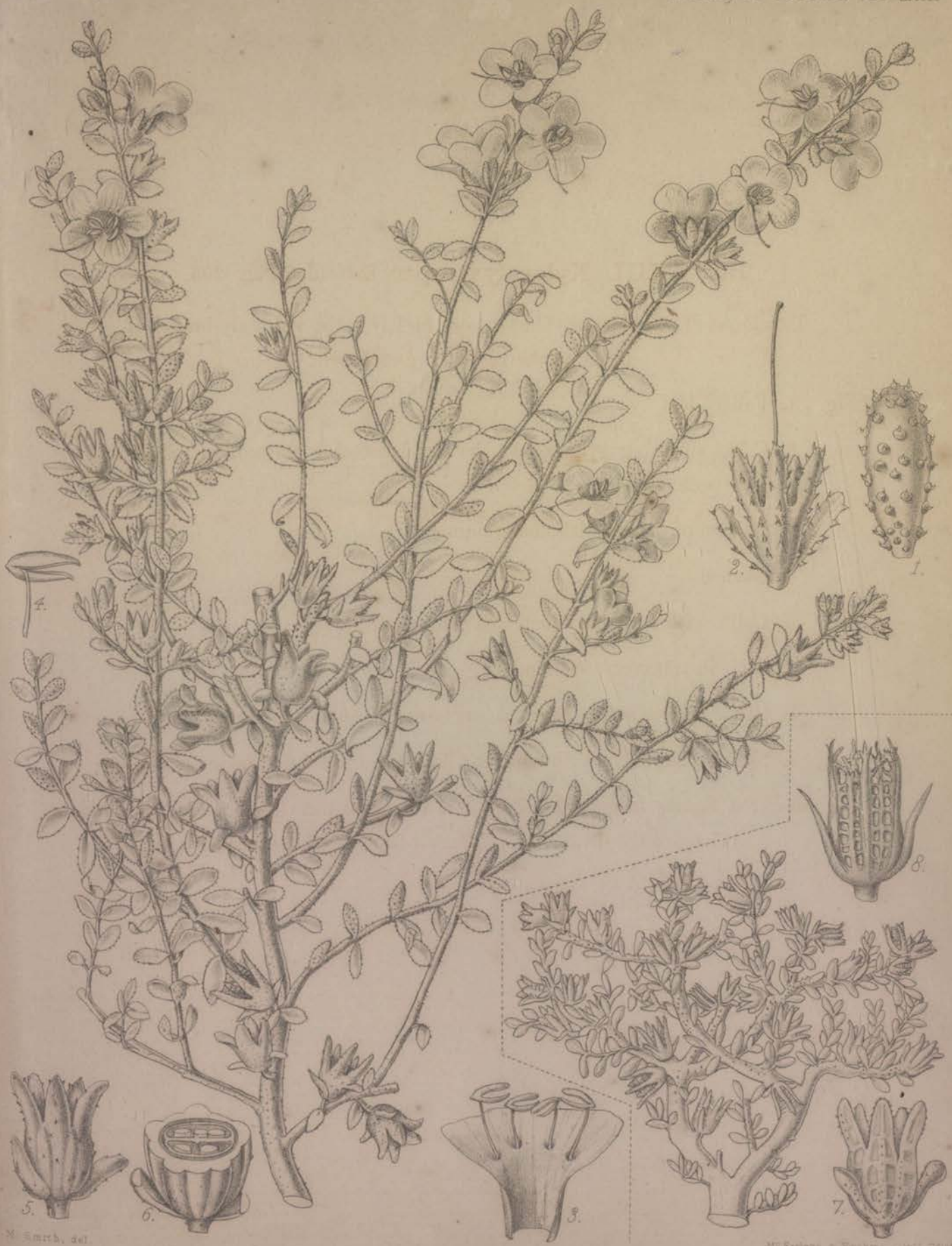
" 5. Calyx with adherent bracteole enclosing fruit.

" 6. Fruit in transverse section.

" 7. Calyx with adherent bracteole enclosing capsule.

" 8. Skeletonised calyx with adherent bracteole enclosing remains of capsule.

All numbered figures magnified. Figs. 1–6 belong to the virgate form; figs. 7–8 belong to the dwarf form. Drawn from dried specimens.



Xylocalyx asper. *Balf. fil.*

TABULA LXIV.

Tab. LXIV. **Ruellia insignis,** Balf. fil. Page 210.

A branch with flowers is shown, and the other figures passing from left to right illustrate a fruit dehiscing still enclosed by the calyx, a corolla with androecium opened out and surrounding the gynæceum, a stamen, seeds, the gynæceum.

All the figures, except that of the branch, are magnified. Drawn from dried specimens.

W.H. Fitch del. et lith.

Ruellia insignis, *Balf. fil.*

Hanhart imp.

TABULA LXV.

Tab. LXV. Ruellia carnea, Balf. fil. Page 211.

Fig. 1. Branch with flowers.

" 2. Corolla with andrœcium opened out and surrounding the gynæceum.

" 3. Stamen.

" 4. Gynæceum.

" 5. Fruit dehiscing.

Figs. 6 and 7. Seeds.

Fig. 1 natural size; rest magnified. Drawn from dried specimens.

W.H. Fitch. del. et lith.

Hanhart. imp.

Ruellia carnea, *Balf. fil.*

TABULA LXVI.

Tab. LXVI. Blepharis spiculifolia, Balf. fil. Page 212.

Branch with flowers, showing habit.

Fig. 1. Foliage-leaf.

" 2. Calyx with bracteoles enclosing gynæceum.

" 3. Sepal.

" 4. Corolla with gynæceum.

" 5. Corolla opened out.

" 6. Stamens.

" 7. Gynæceum.

" 8. Young fruit.

All numbered figures magnified. Drawn from dried specimens.

M. Smith, del.

Blepharis spiculifolia, *Balf. fil.*

TABULA LXVII.

Tab. LXVII. Barleria aculeata, Balf. fil. Page 212.

Fig. 1. Branch with flowers, showing habit.

" 2. Foliage-leaf.

" 3. Dissected flower, corolla and andrœcium removed, enclosed by bracteoles.

" 4. Dissected flower, corolla and andrœcium removed and calyx opened to show gynæceum.

" 5. Lateral view of flower not quite expanded, with portion of calyx removed.

" 6. Corolla opened out, showing stamens, staminodes, and gynæceum.

" 7. Back and face views of anther.

" 8. Staminodes.

" 9. Disk and ovary.

1 natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.

H.F.H. del.

M'Farlane & Erskine, Lith.rs Edin.r

Barleria aculeata, *Balf. fil.*

TABULA LXVIII.

Tab. LXVIII. Barleria tetracantha, Balf. fil. Page 213.

Branch with flowers, showing habit.

Fig. 1. Foliage-leaf.

" 2. Calyx with bracteoles enclosing gynæceum.

" 3. Corolla with androecium opened out.

" 4. Antero-lateral anther, back and face views; the portions of filament shown should be slightly puberulous.

" 5. Postero-lateral anther, back and face views; the portions of filament shown should be slightly puberulous.

" 6. Gynæceum.

" 7. Fruit.

All numbered figures magnified. Drawn from dried specimens.

M. Smith. del.

Mc Farlane & Erskine, Lith.rs Edint

Barleria tetracantha, *Balf. fil.*

TABULA LXIX.

Tab. LXIX, A. Neuracanthus aculeatus, Balf. fil. Page 215.

Whole plant in flower.

Fig. 1. Foliage-leaf.

" 2. Flower in axil of bract.

" 3. Calyx.

" 4. Corolla with andrœcium opened out.

" 5. Antero-lateral anther, back and face views.

" 6. Postero-lateral anther, back and face views.

" 7. Gynæceum.

" 8. Young capsule.

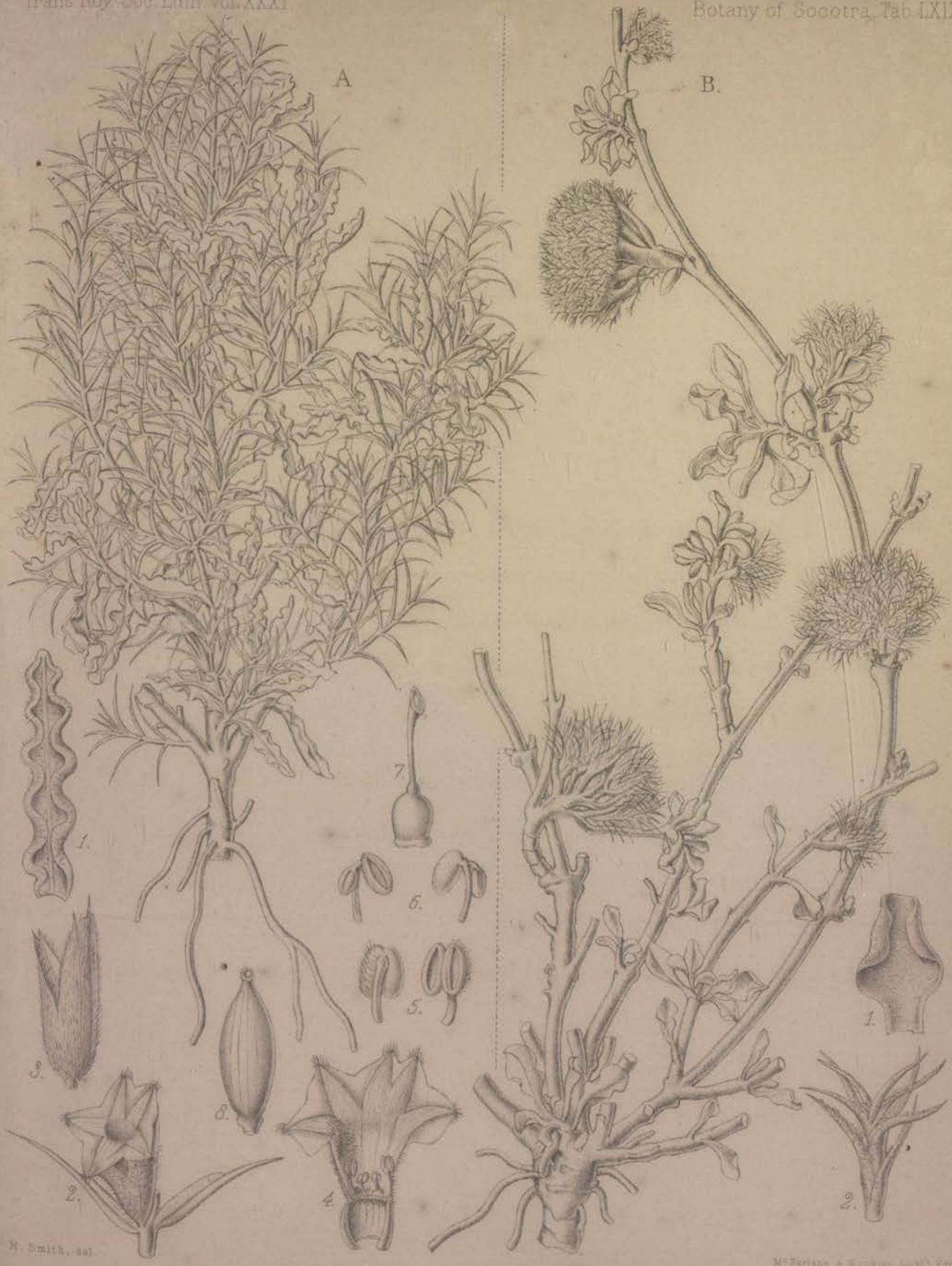
B. Neuracanthus capitatus, Balf. fil. Page 216.

Portion of plant showing habit.

Fig. 1. Foliage-leaf.

" 2. Lateral branchlet.

All numbered figures in both A and B magnified. Drawn from dried specimens.



A. Neuracanthus aculeatus, *Balf. fil.*
B. Neuracanthus capitatus, *Balf. fil.*

TABULA LXX.

Tab. LXX. Ballochia amœna, Balf. fil. Page 218.

Branch with flowers.

Fig. 1. Flower.

" 2. Dissected flower, corolla and andrœcium removed.

" 3. Portion of corolla-tube showing andrœcium.

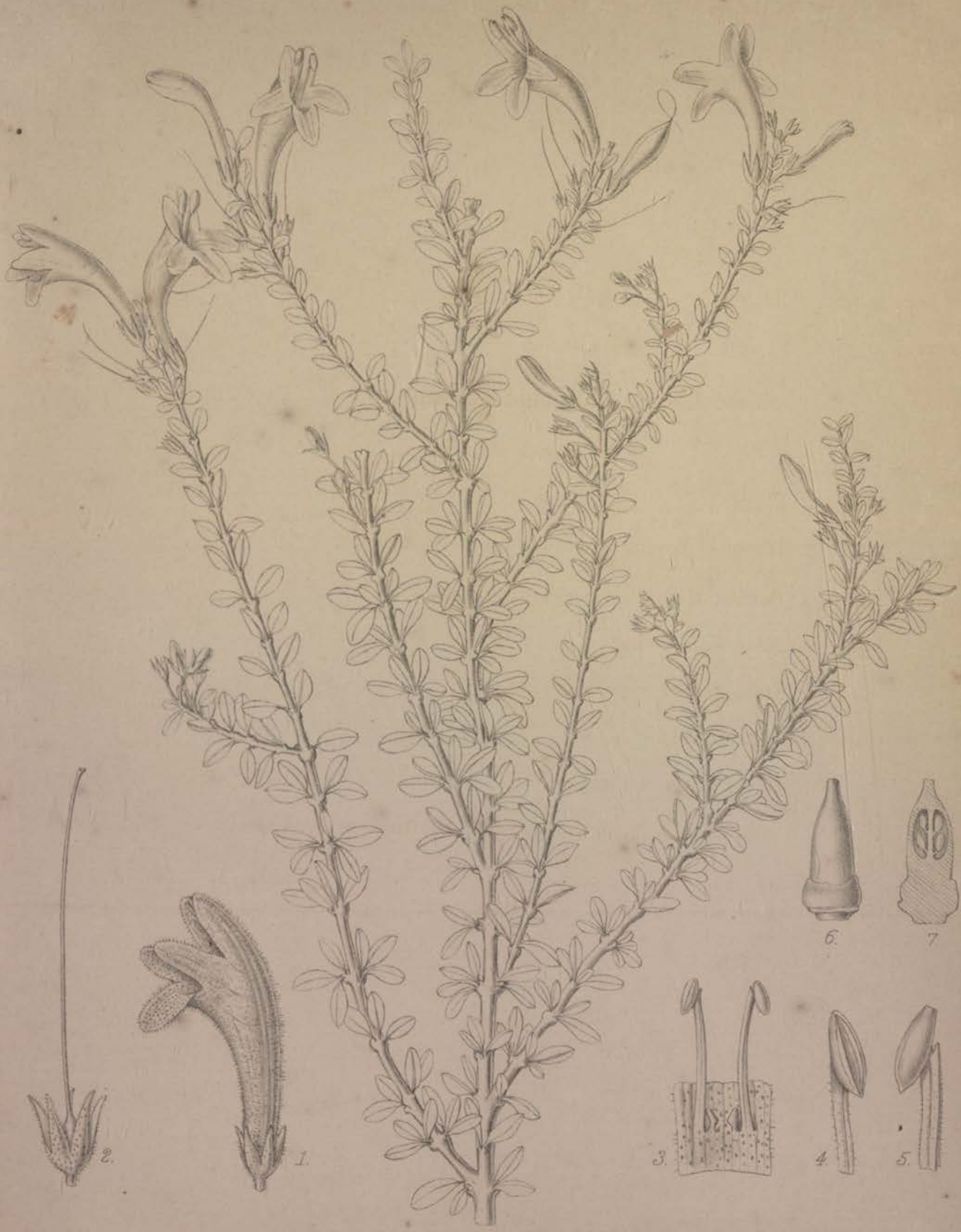
" 4. Stamen, face view.

" 5. Stamen, back view.

" 6. Ovary.

" 7. Ovary in vertical section.

All numbered figures magnified. Drawn from dried specimens.



Ballochia amœna. *Balf. fil.*

TABULA LXXI.

Tab. LXXI, A. Ballochia rotundifolia, Balf. fil. Page 218.

Two branches showing variation in size of leaves.

Fig. 1. Dissected flower, corolla and androecium removed.

" 2. Portion of corolla-tube with androecium.

" 3. Anther.

" 4. Ovary.

" 5. Fruit dehiscing.

B. Ballochia atro-virgata, Balf. fil. Page 219.

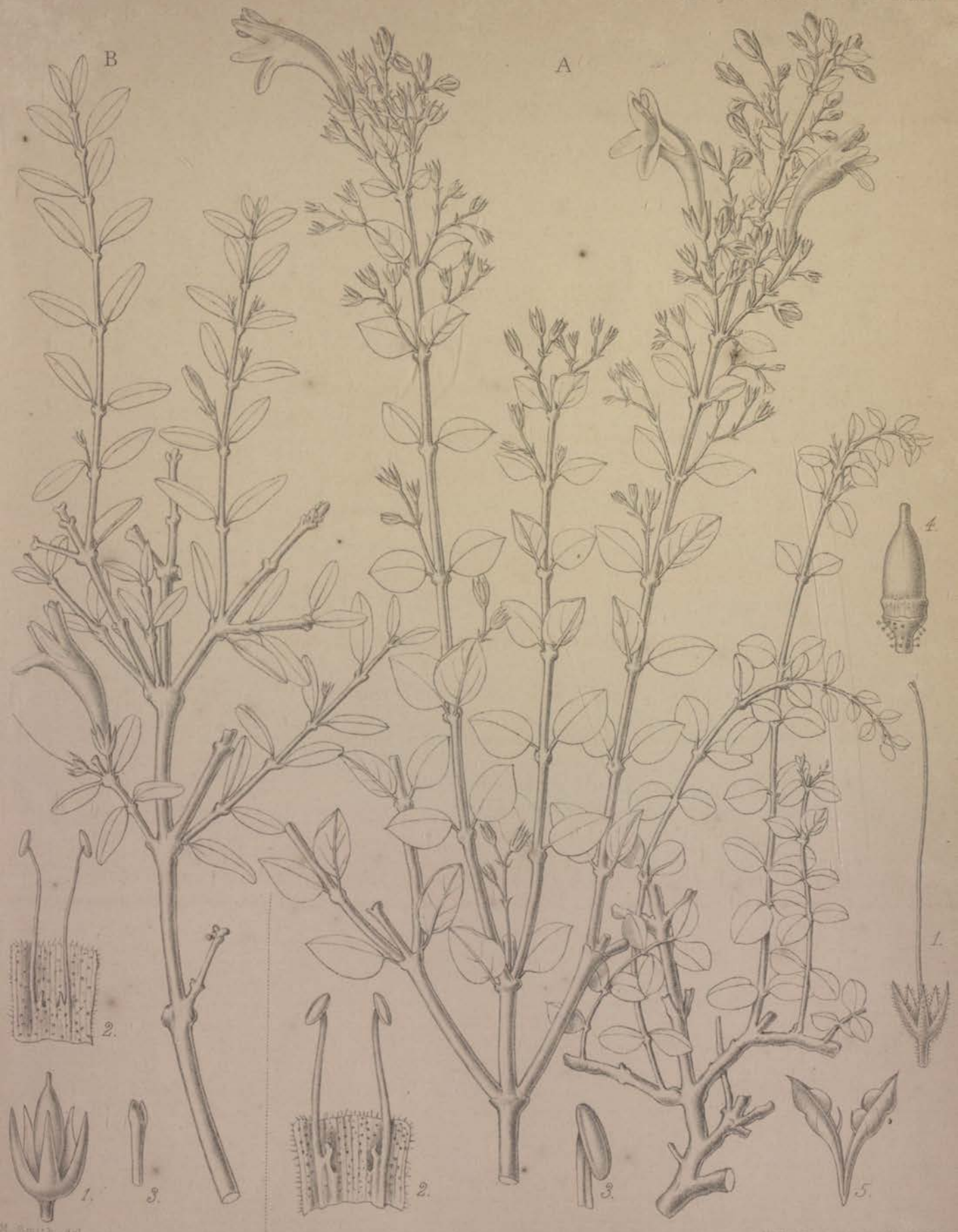
Branch with flower showing habit.

Fig. 1. Dissected flower, corolla with androecium and style removed.

" 2. Portion of corolla-tube with androecium.

" 3. Apex of style.

All numbered figures in both A and B magnified. Drawn from dried specimens.



A. Ballochia rotundifolia. *Balf. fil.*
B. Ballochia atro-vigata. *Balf. fil.*

TABULA LXXII.

Tab. LXXII. Justicia rigida, Balf. fil. Page 220.

Branch showing habit.

Fig. 1. Portion of branch with inflorescence.

" 2. Flower.

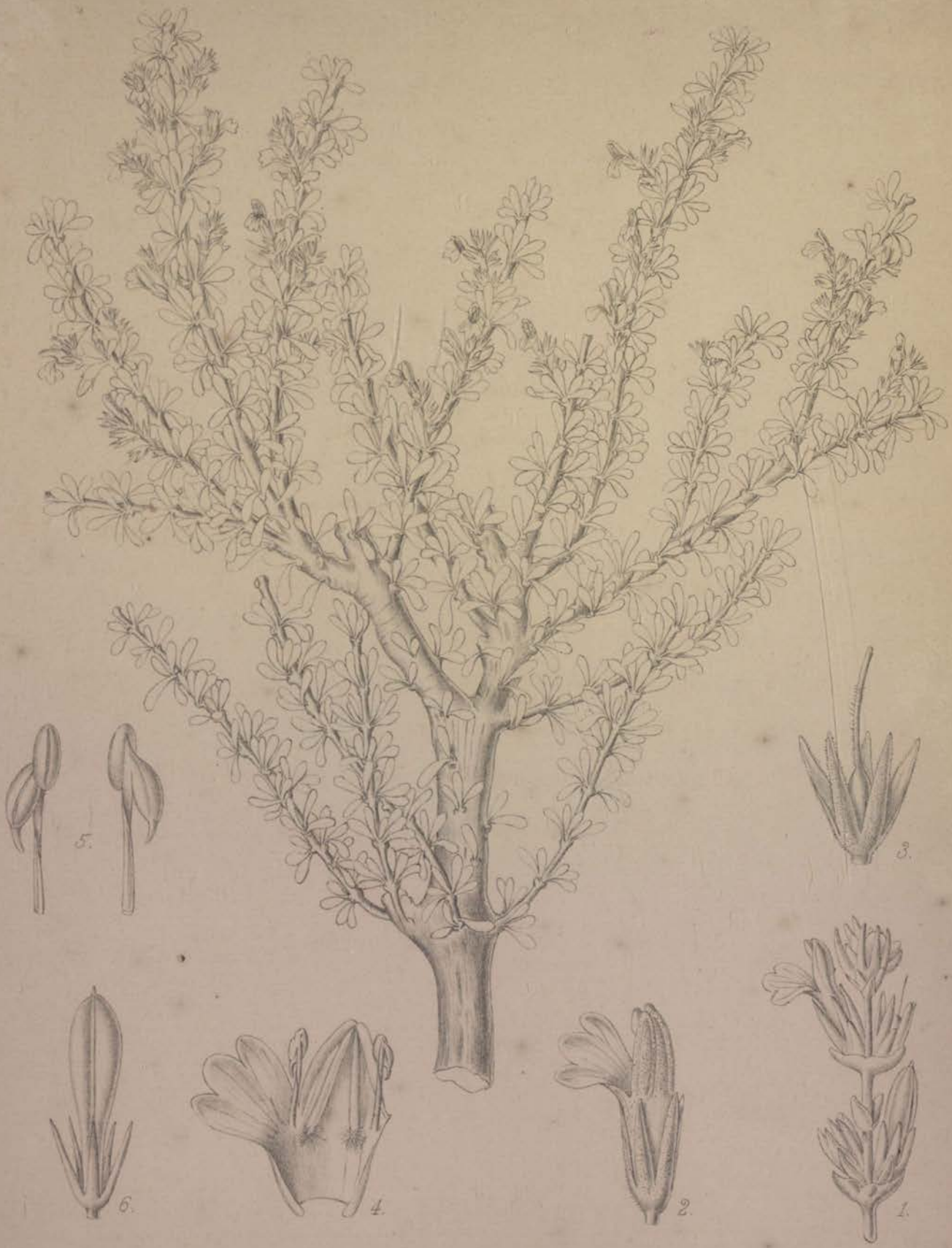
" 3. Dissected flower, corolla and androecium removed.

" 4. Corolla opened out, showing androecium.

" 5. Stamen, back and face views.

" 6. Young fruit surrounded by calyx.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del. McFarlane & Erskine, Lith^rs Edin^r

Justicia rigida, *Balf. fil.*

TABULA LXXIII.

Tab. LXXIII, A. Trichocalyx obovatus, Balf. fil. Page 222.

Branch with foliage-leaves and inflorescence showing habit.

Fig. 1. Dissected flower, corolla and androecium removed.

" 2. Corolla.

" 3. Stamen, face view.

" 4. Stamen, back view.

" 5. Ovary with disk.

B. Trichocalyx orbiculatus, Balf. fil. Page 222.

Branch with foliage-leaves and inflorescence showing habit.

Fig. 1. Flower.

" 2. Stamen, face view.

" 3. Stamen, back view.

" 4. Gynæceum.

" 5. Fruit.

All numbered figures in both A and B magnified. Drawn from dried specimens.

A. Trichocalyx obovatus, *Balf. fil.*
B. Trichocalyx orbiculatus, *Balf. fil.*

TABULA LXXIV.

Tab. LXXIV. Anisotes diversifolius, Balf. fil. Page 223.

Fig. 1. Branch with inflorescence.

" 2. Side view of flower.

" 3. Corolla opened, showing stamens and gynæceum.

" 4. Back and face views of anther.

" 5. Gynæceum.

" 6. Ovary and disk.

" 7. Young fruits.

" 8. Small portion of the variety **brevicalyx**, Balf. fil.

1, 7, and 8 natural size; rest magnified. Drawn from dried specimens by Mrs Thiselton-Dyer.

Anisotes diversifolius. *Balf. fil.*

TABULA LXXV.

Tab. LXXV. Rhinacanthus scoparius, Balf. fil. Page 224.

Branch with inflorescence showing habit.

Fig. 1. Leaf.

" 2. Portion of inflorescence.

" 3. Dissected flower, corolla and andrœcium removed.

" 4. Corolla with andrœcium.

" 5. Stamen, face view.

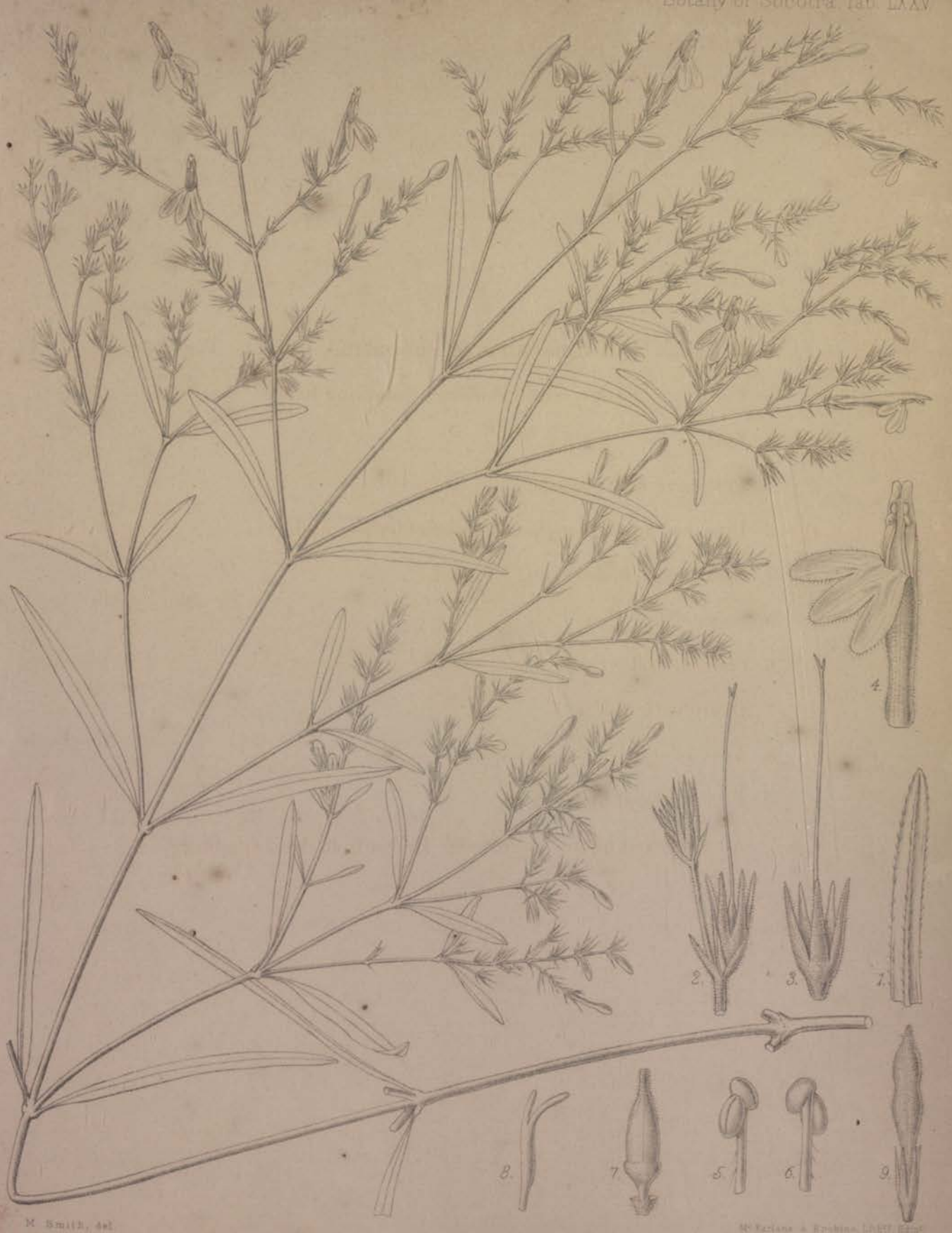
" 6. Stamen, back view.

" 7. Ovary with disk.

" 8. Apex of style.

" 9. Fruit enclosed by calyx.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

Rhinacanthus scoparius, *Balf. fil.*

TABULA LXXVI.

Tab. LXXVI. Ancalanthus paucifolius, Balf. fil. Page 225.

Two branches shown; that to the left from the lower part of the vegetative axis, that to the right shows foliage-leaves and terminal inflorescences.

Fig. 1. Flower.

" 2. Bract.

" 3. Stamen, face view.

" 4. Stamen, back view.

" 5. Gynæceum.

All numbered figures magnified. Drawn from dried specimens.

M. Smith. del.

Mc Farlane & Erskine, Lith^rs Edin^r

Ancalanthus paucifolius. *Balf. fil.*

TABULA LXXVII.

Tab. LXXVII, A. Ecbolium striatum, Balf. fil. Page 226.

Fig. 1. Branch with foliage-leaves.

" 2. Branch with inflorescence.

" 3. Bract.

" 4. Flower with bracteoles.

" 5. Dissected flower, calyx removed, corolla with andrœcium opened out and partially removed from around gynæceum.

" 6. Stamen.

" 7. Gynæceum.

B. Ecbolium striatum, Balf. fil., var. minor, Balf. fil. Page 227.

Fig. 1. Branch with inflorescence.

" 2. Fruit enclosed in calyx and bracteoles.

" 3. Seed.

1 in A and B, natural size; rest magnified. Drawn from dried specimens.

W.H. Fitch del. et lith.

A. Ecbolium striatum, *Balf. fil.*
B. Ecbolium striatum, *var. minor, Balf. fil.*

Hanhart. imp.

TABULA LXXVIII.

Tab. LXXVIII. Cockburnia socotrana, Balf. fil. Page 231.

Branch with inflorescence showing habit.

Fig. 1. Flower.

" 2. Bract.

" 3. Calyx.

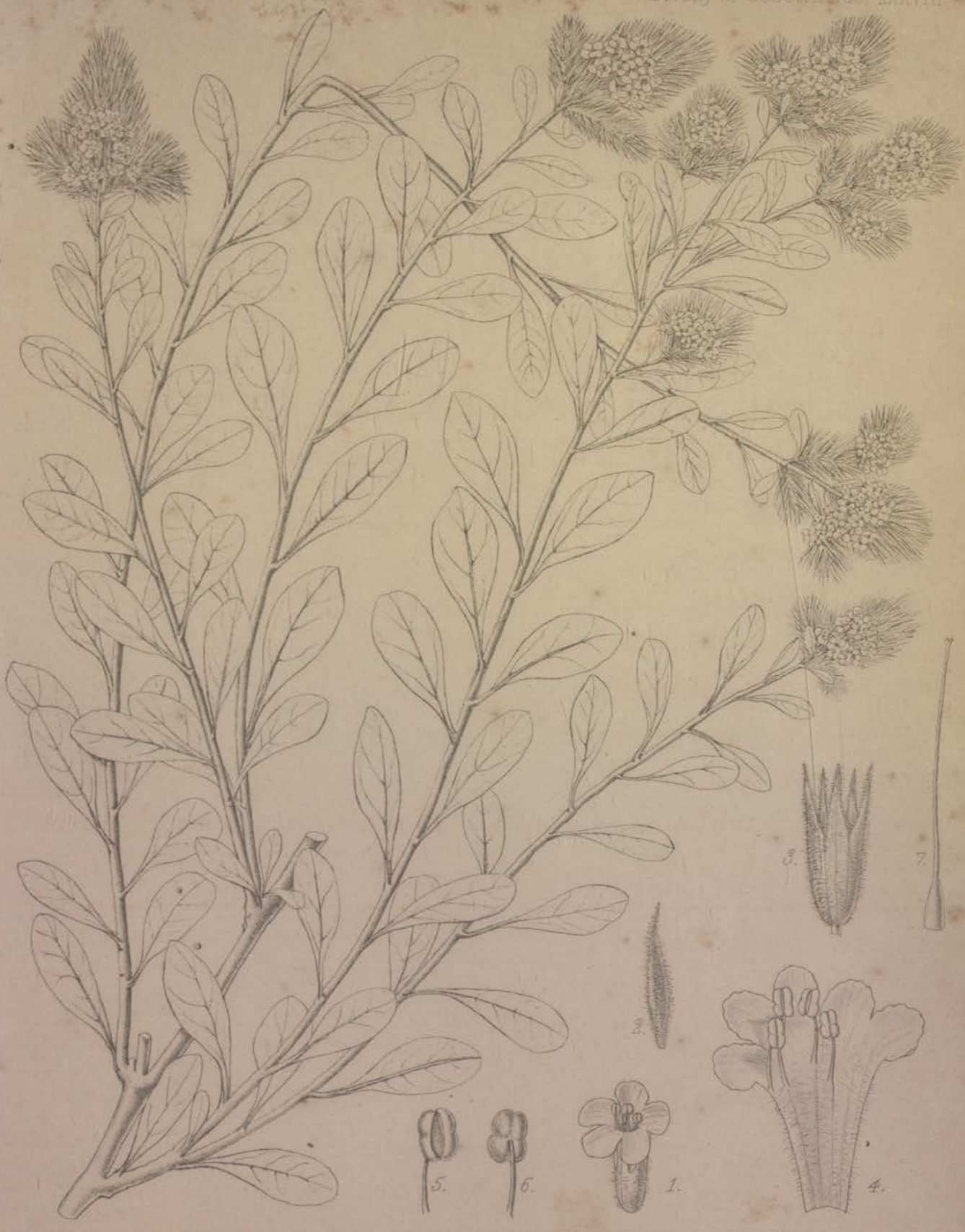
" 4. Corolla with andrœcium opened out.

" 5. Stamen, face view.

" 6. Stamen, back view.

" 7. Gynæceum.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del. M. Farlane & Erskine, Lith^rs Edin.

Cockburnia socotrana, *Balf. fil.*

TABULA LXXIX.

Tab. LXXIX. Cœlocarpus socotranus, Balf. fil. Page 233.

Two branches shown; the lower shows inflorescence, the upper shows fruit.

Fig. 1. Flower.

" 2. Calyx.

" 3. Corolla with androœcium opened out.

" 4. Stamen, back and face views.

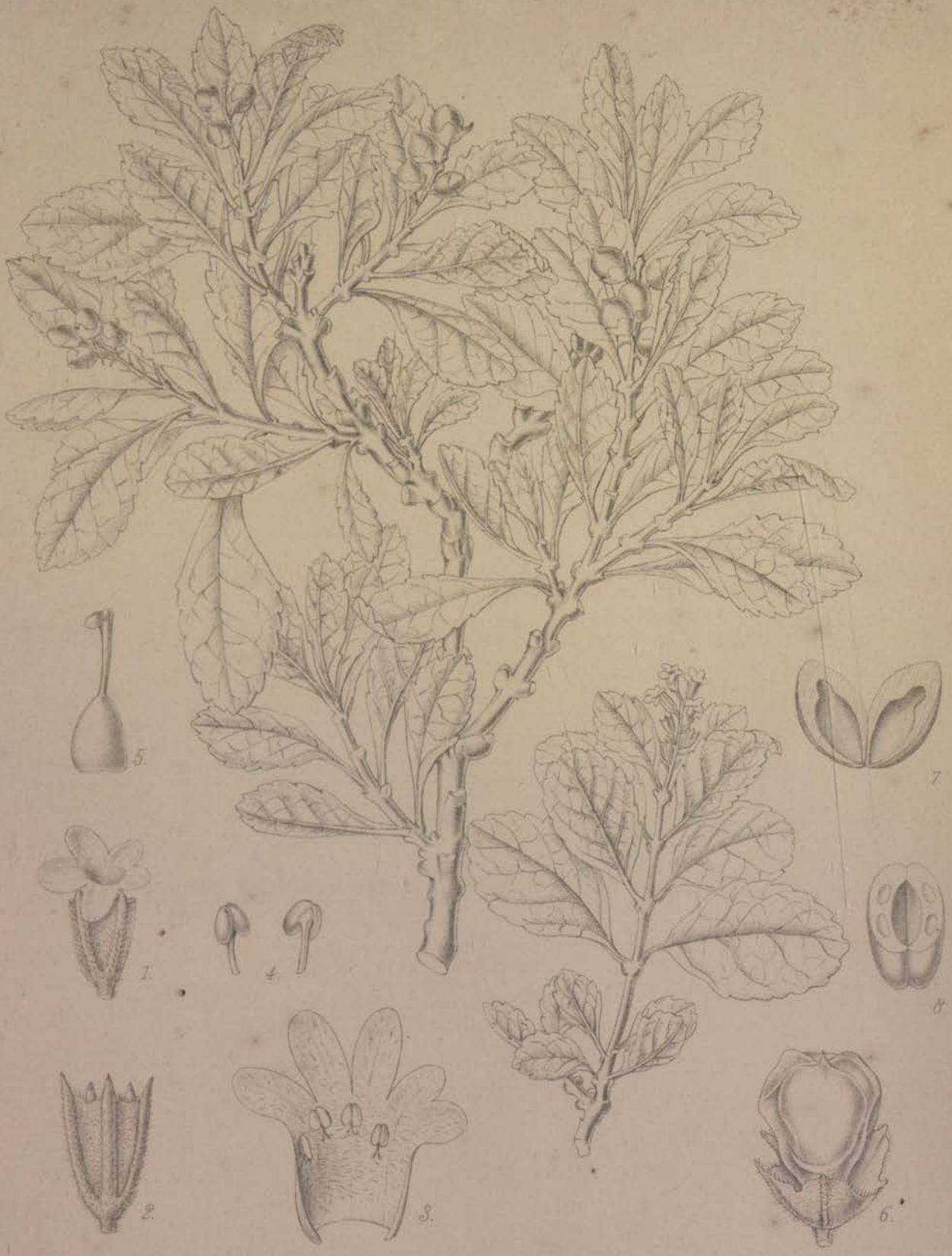
" 5. Gynæceum.

" 6. Fruit surrounded by calyx.

" 7. Fruit in vertical section.

" 8. Fruit in transverse section.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

M.c Farlane & Erskine, Lith.rs Edin.r

Coelocarpus socotranus, *Balf. fil.*

TABULA LXXX.

Tab. LXXX. Clerodendron galeatum, Balf. fil. Page 235.

Two branches showing foliage-leaves and inflorescence.

Fig. 1. Expanded flower.

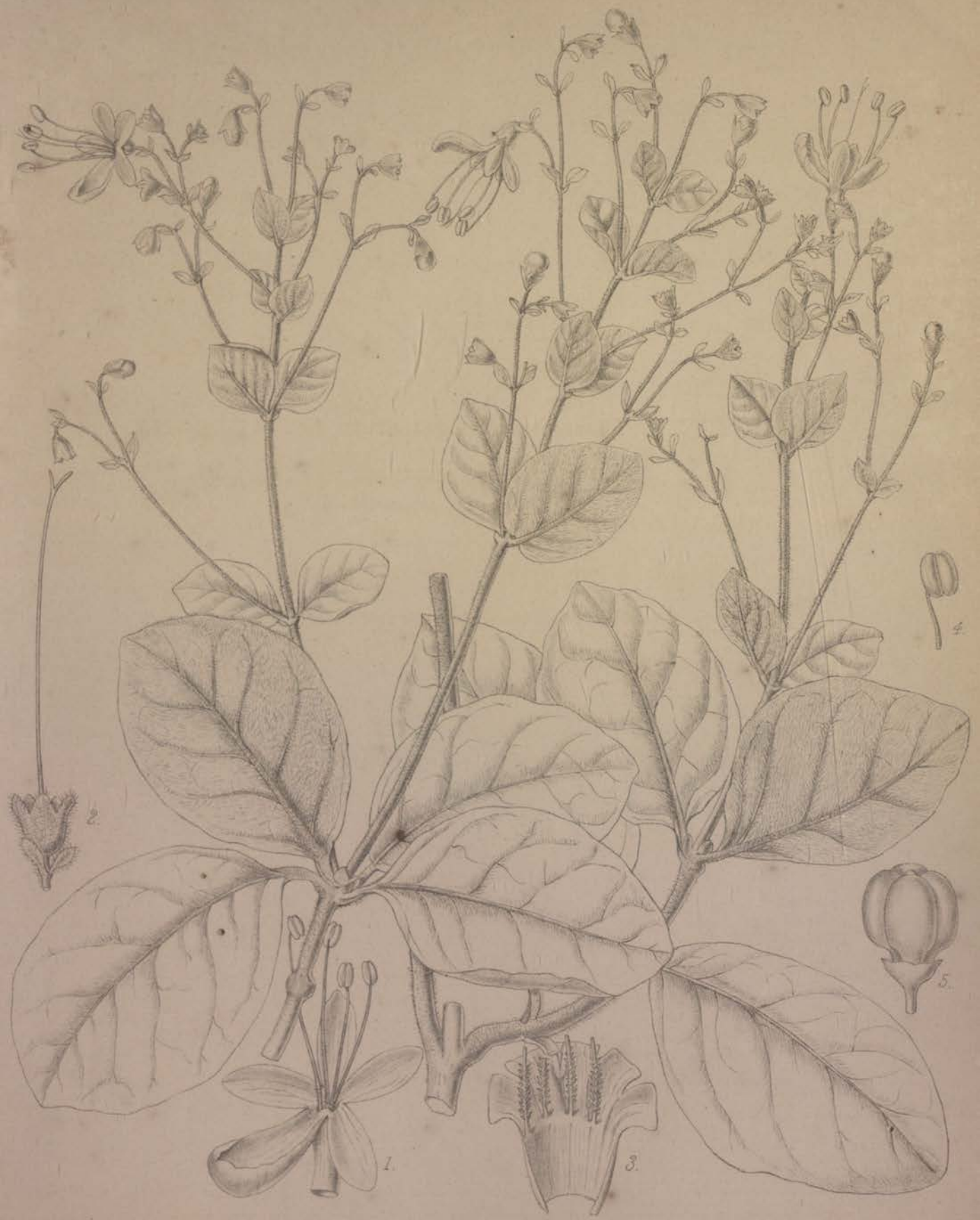
" 2. Dissected flower, corolla with andrœcium removed.

" 3. Portion of corolla opened out, showing insertion of stamens.

" 4. Anther and portion of filament.

" 5. Fruit.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del. Mc Farlane & Erskine, Lith^rs Edin^r

Clerodendron galeatum, *Balf. fil.*

TABULA LXXXI.

Tab. LXXXI, A. Lasiocarys spiculifolia, Balf. fil. Page 244.

Large branch with flowers showing habit.

Fig. 1. Calyx with bracteoles.

" 2. Corolla with androecium laid open.

" 3. Gynæceum with disk.

B. Lasiocarys flagellifera, Balf. fil. Page 244.

Plant showing habit.

Fig. 1. Foliage-leaf.

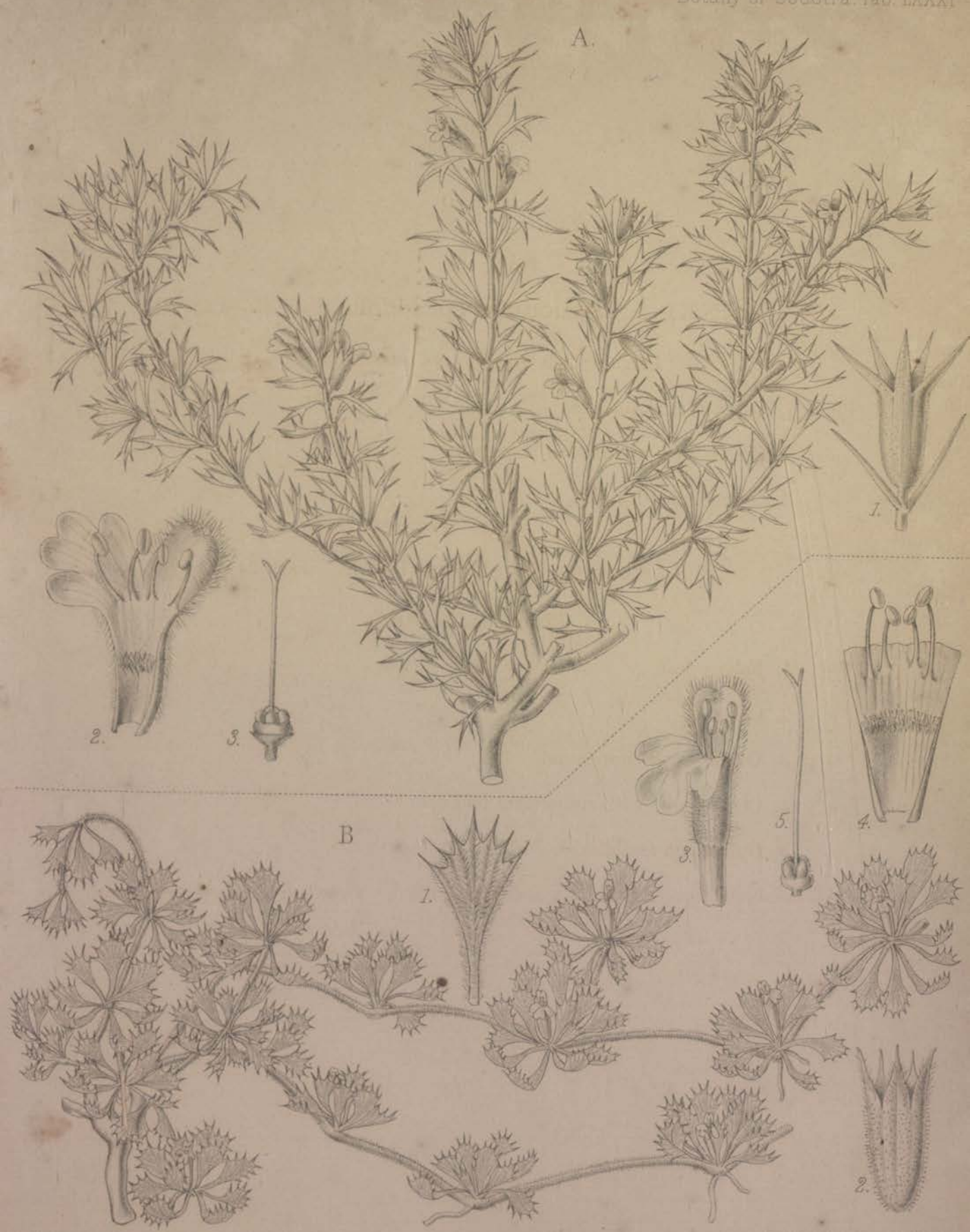
" 2. Calyx.

" 3. Corolla with androecium.

" 4. Corolla-tube with androecium laid open.

" 5. Gynæceum and disk.

All numbered figures in both A and B magnified. Drawn from dried specimens.



M. Smith, del. Mc Farlane & Erskine, Lith^rs Edin^r

A. Lasiocarys spiculifolia. *Balf. fil.*
B. Lasiocarys flagellifera. *Balf. fil.*

TABULA LXXXII.

Tab. LXXXII, A. Wellstedia socotrana, Balf. fil. Page 249.

Plant without root showing habit.

Fig. 1. Foliage-leaf.

" 2. Portion of inflorescence.

" 3. Dissected flower, corolla and andrœcium removed.

" 4. Corolla with andrœcium, the petals fully expanded.

" 5. Corolla with andrœcium, the petals incurved.

" 6. Gynæceum.

" 7. Ovary in vertical section.

" 8. Fruit enclosed by calyx.

" 9. Fruit in vertical section.

" 10. Septum from fruit.

" 11. Seed.

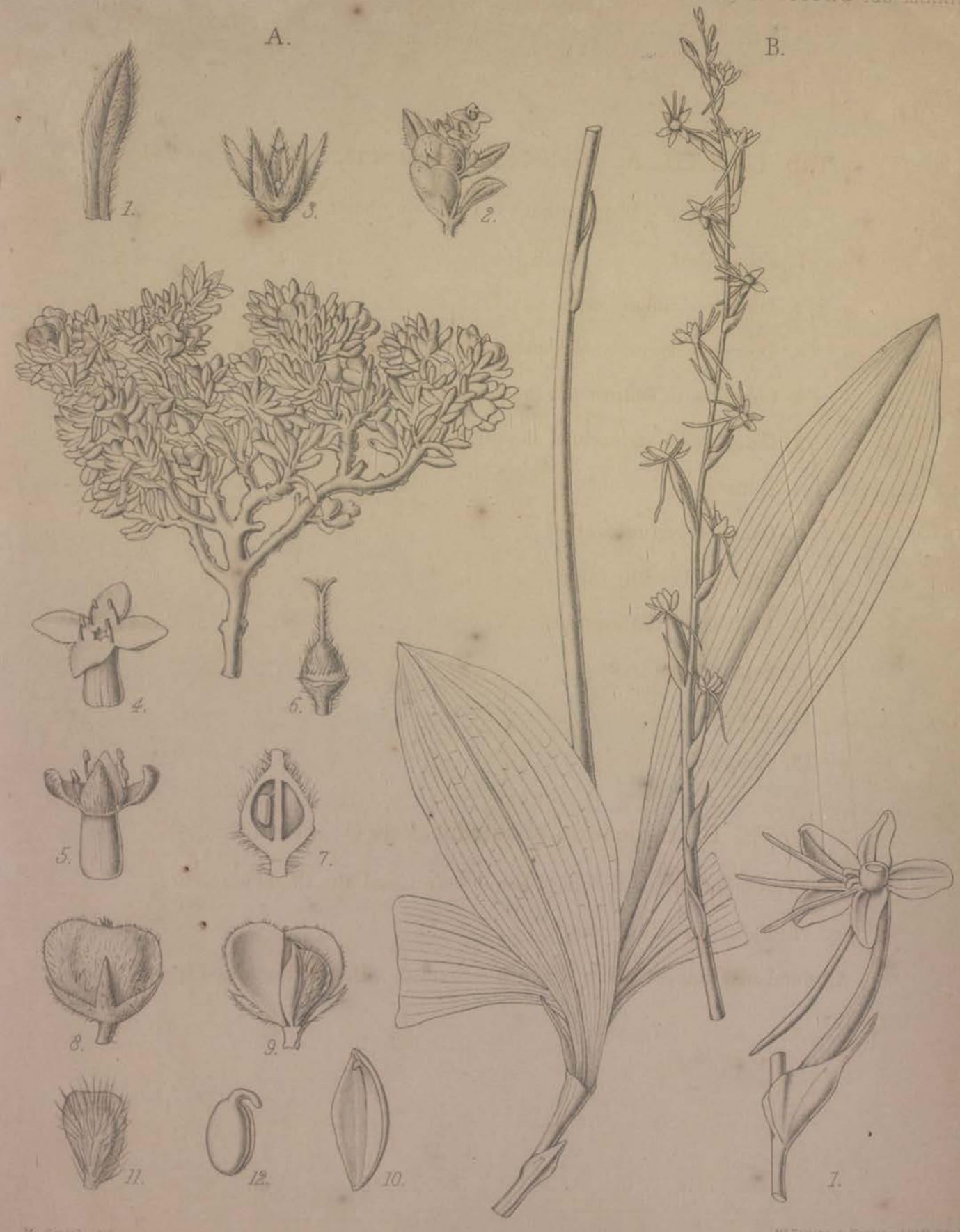
" 12. Embryo.

B. Habenaria socotrana, Balf. fil. Page 285.

Portion of stem with foliage-leaves shown, and also the inflorescence.

Fig. 1. Flower in axil of bract.

All numbered figures in both A and B magnified. Drawn from dried specimens.



A. Wellstedia socotrana. *Balf. fil.*
B. Habenaria socotrana. *Balf. fil.*

TABULA LXXXIII.

Tab. LXXXIII. Haya obovata, Balf. fil. Page 251.

Plant showing habit.

Fig. 1. Base of leaf with stipules.

" 2. Inflorescence.

" 3. Flower with bracts.

" 4. Bract.

" 5. Flower.

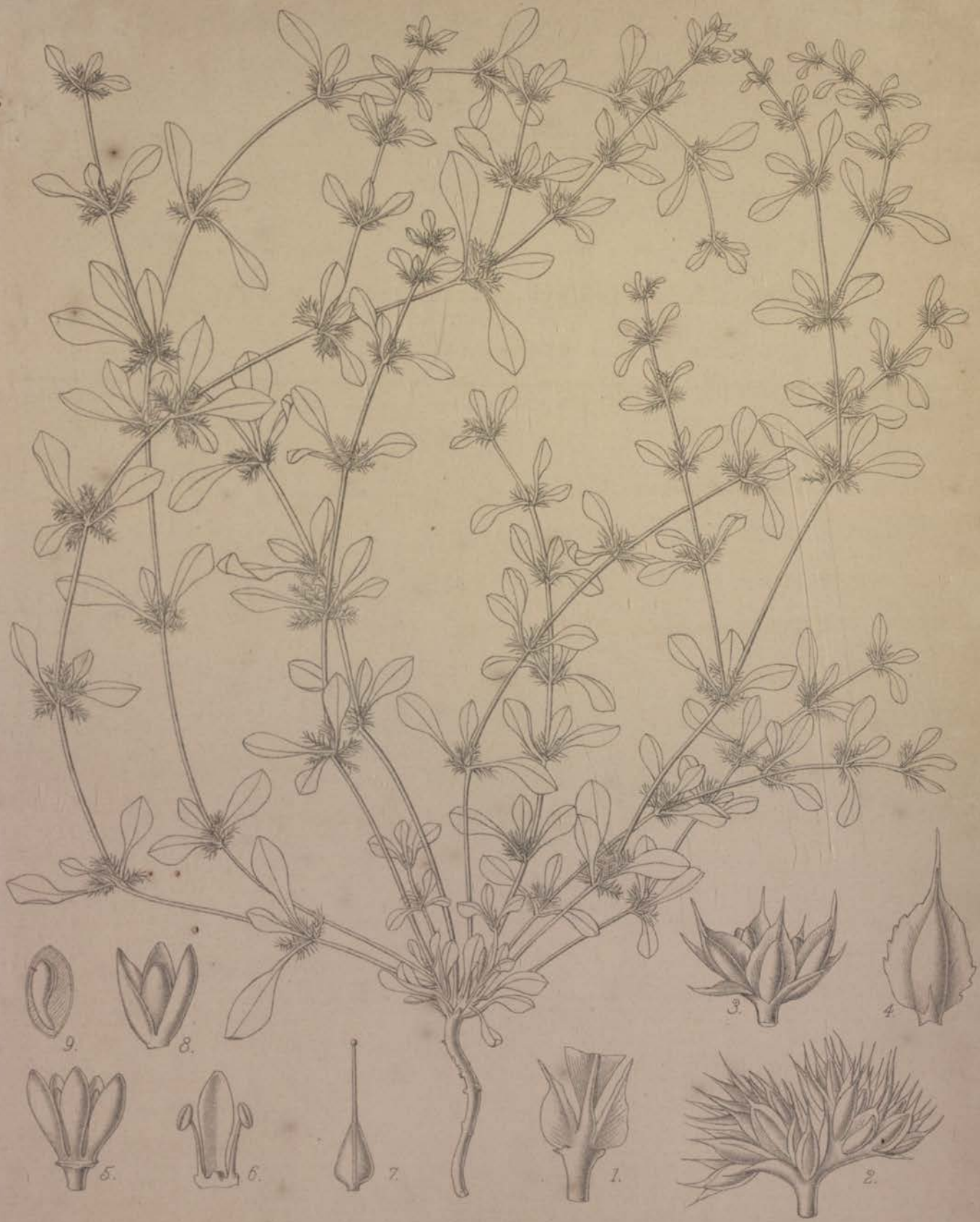
" 6. Perianth-segment, with two stamens.

" 7. Gynæceum.

" 8. Fruit opened.

" 9. Seed in section.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

M'Farlane & Erskine, Lith. Edin.

Haya obovata, *Balf. fil.*

TABULA LXXXIV.

Tab. LXXXIV. Lochia bracteata, Balf. fil. Page 252.

Branch with foliage-leaves and inflorescence showing habit.

Fig. 1. Leaf with stipules.

" 2. Inflorescence.

" 3. Bract of whole inflorescence.

" 4. Flower.

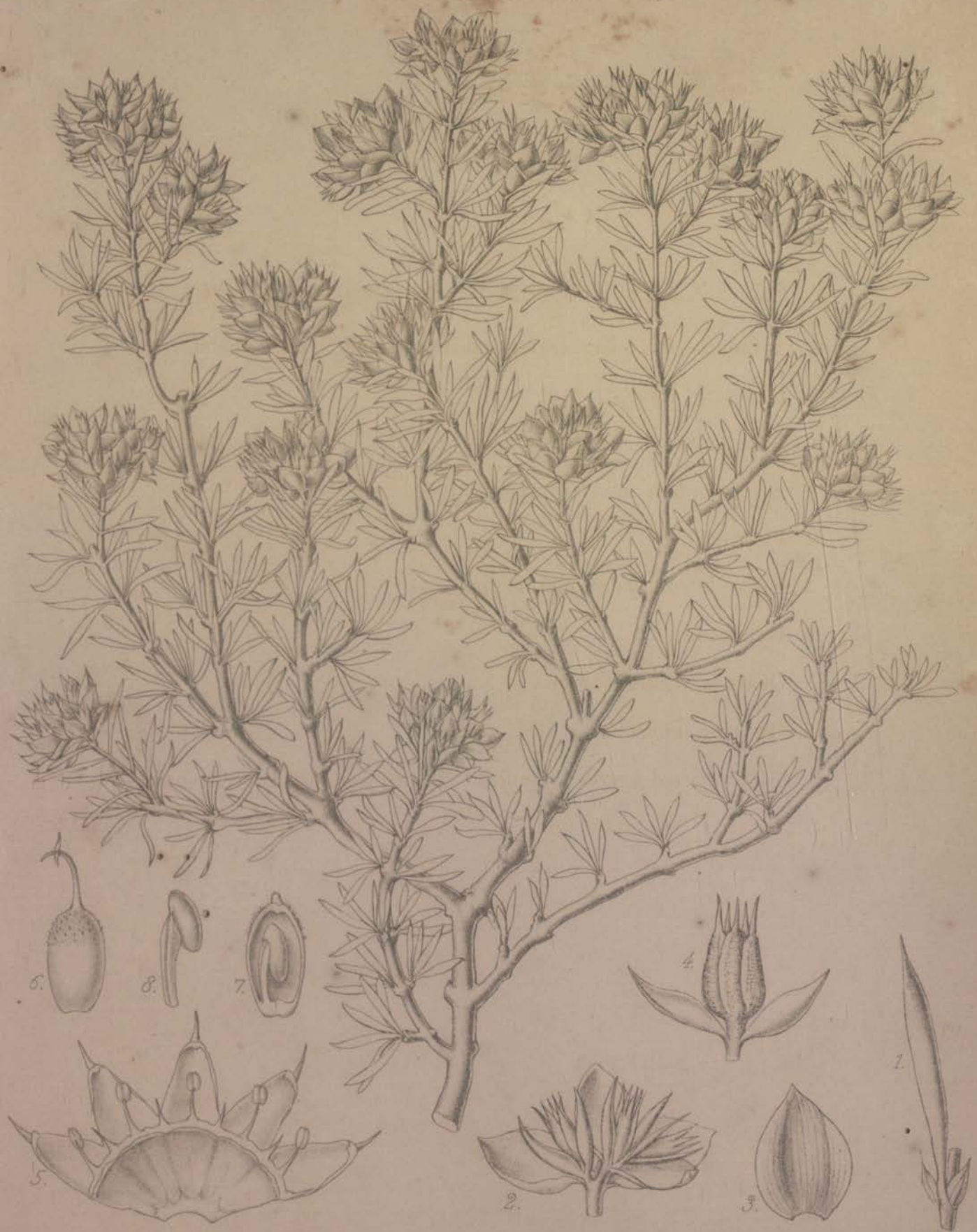
" 5. Perianth with androecium laid open.

" 6. Gynæceum.

" 7. Ovary in vertical section.

" 8. Ovule on funiculus.

All numbered figures magnified. Drawn from dried specimens.



Lochia bracteata. *Balf. fil.*

TABULA LXXXV.

Tab. LXXXV. Aerua microphylla, Moq. Page 254.

Two branches with inflorescence showing habit; that on the right is the plain-form; that on the left is the hill-form.

Fig. 1. Flower with bract.

" 2. Bract.

" 3. Flower laid open.

" 4. Larger perianth-segment.

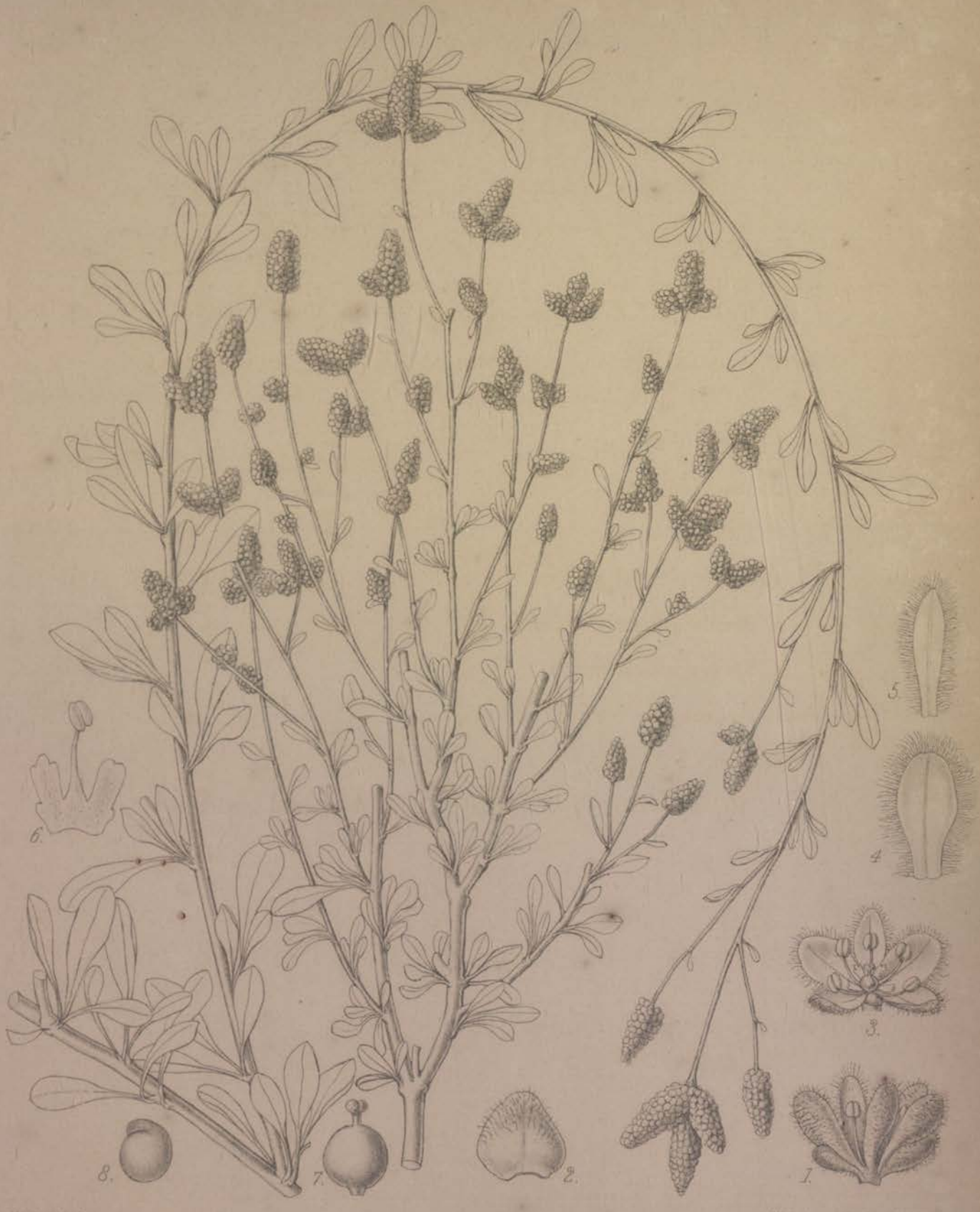
" 5. Smaller perianth-segment.

" 6. Stamen with staminode.

" 7. Gynæceum.

" 8. Seed.

All numbered figures magnified. Drawn from dried specimens.



Aerua microphylla. *Moq.*

TABULA LXXXVI.

Tab. LXXXVI. Lasiosiphon socotranus, Balf. fil. Page 260.

Branch with inflorescence showing habit.

Fig. 1. Bract.

" 2. Flower.

" 3. Calyx with androecium laid open.

" 4. Tube of calyx in vertical section enclosing gynæceum.

" 5. Gynæceum.

All numbered figures magnified. Drawn from dried specimens.

M. Smith, del.

McFarlane & Erskine Lith.t Edin.r

Lasiosiphon socotranus, *Balf. fil.*

TABULA LXXXVII.

Tab. LXXXVII. Osyris pendula, Balf. fil. Page 262.

Branch with flowers showing habit.

Fig. 1. Cluster of small staminate flowers.

" 2. Staminate flower unexpanded.

" 3. Expanded staminate flower.

" 4. Anther, back and face views.

" 5. Large staminate flower.

" 6. Large staminate flower in vertical section.

All numbered figures magnified. Drawn from dried specimens.

M. Smith. del.

McFarlane & Erskine, Litho. Edin.

Osyris pendula. *Balf. fil.*

TABULA LXXXVIII.

Tab. LXXXVIII. Euphorbia socotrana, Balf. fil. Page 265.

Branch with inflorescence showing habit.

Fig. 1. Capitulum.

" 2. Portion of involucre.

" 3 and 4. Interfloral bracteoles.

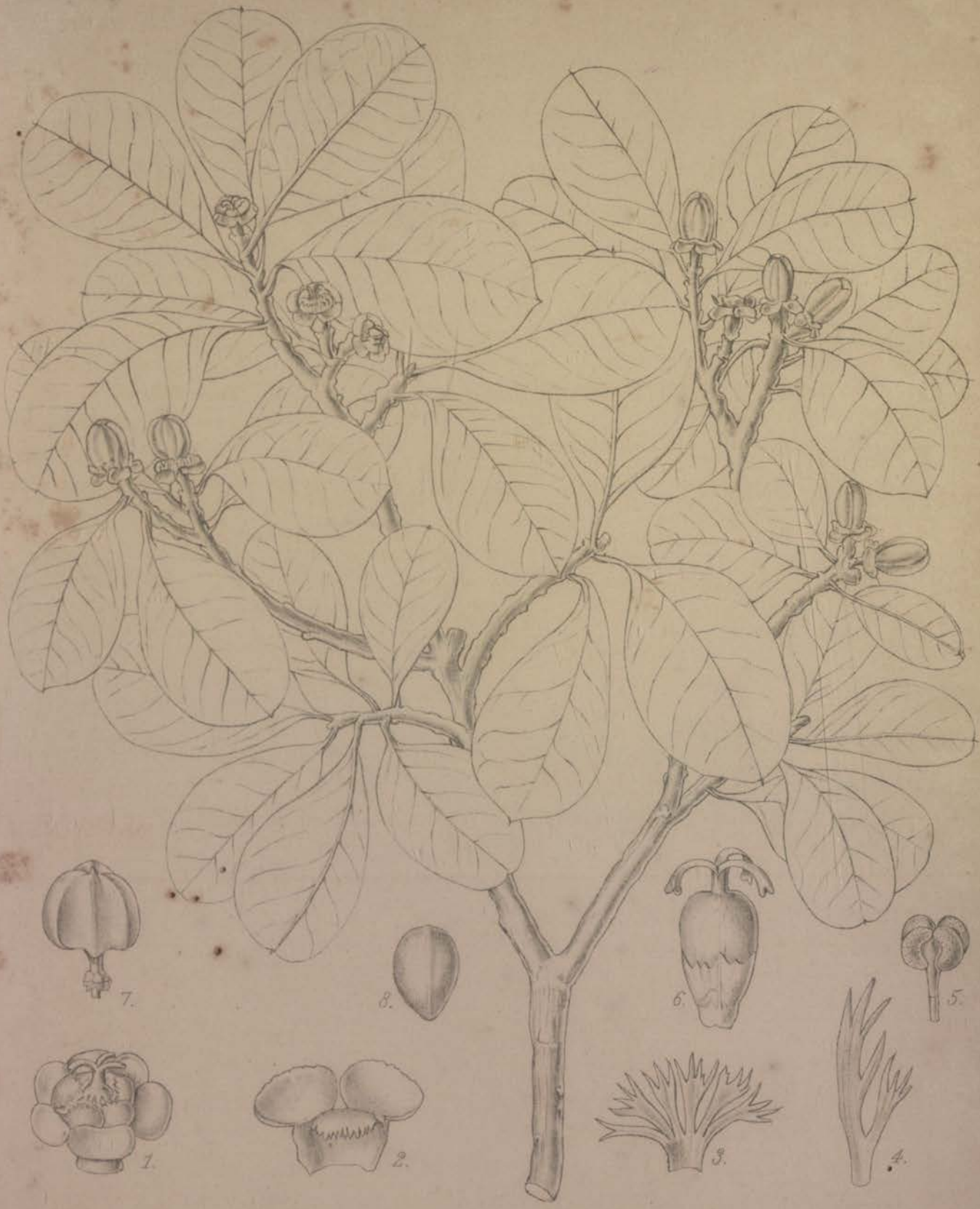
" 5. Stamen.

" 6. Gynæceum.

" 7. Young fruit.

" 8. Seed.

All numbered figures magnified. Drawn from dried specimens.



M. Smith, del.

Euphorbia socotrana. *Balf. fil.*

TABULA LXXXIX.

Tab. LXXXIX. Euphorbia arbuscula, Balf. fil. Page 268.

Two branches showing habit; that to the left with young inflorescences; that to the right with fruits.

Fig. 1. Inflorescence.

" 2. Portion of involucre.

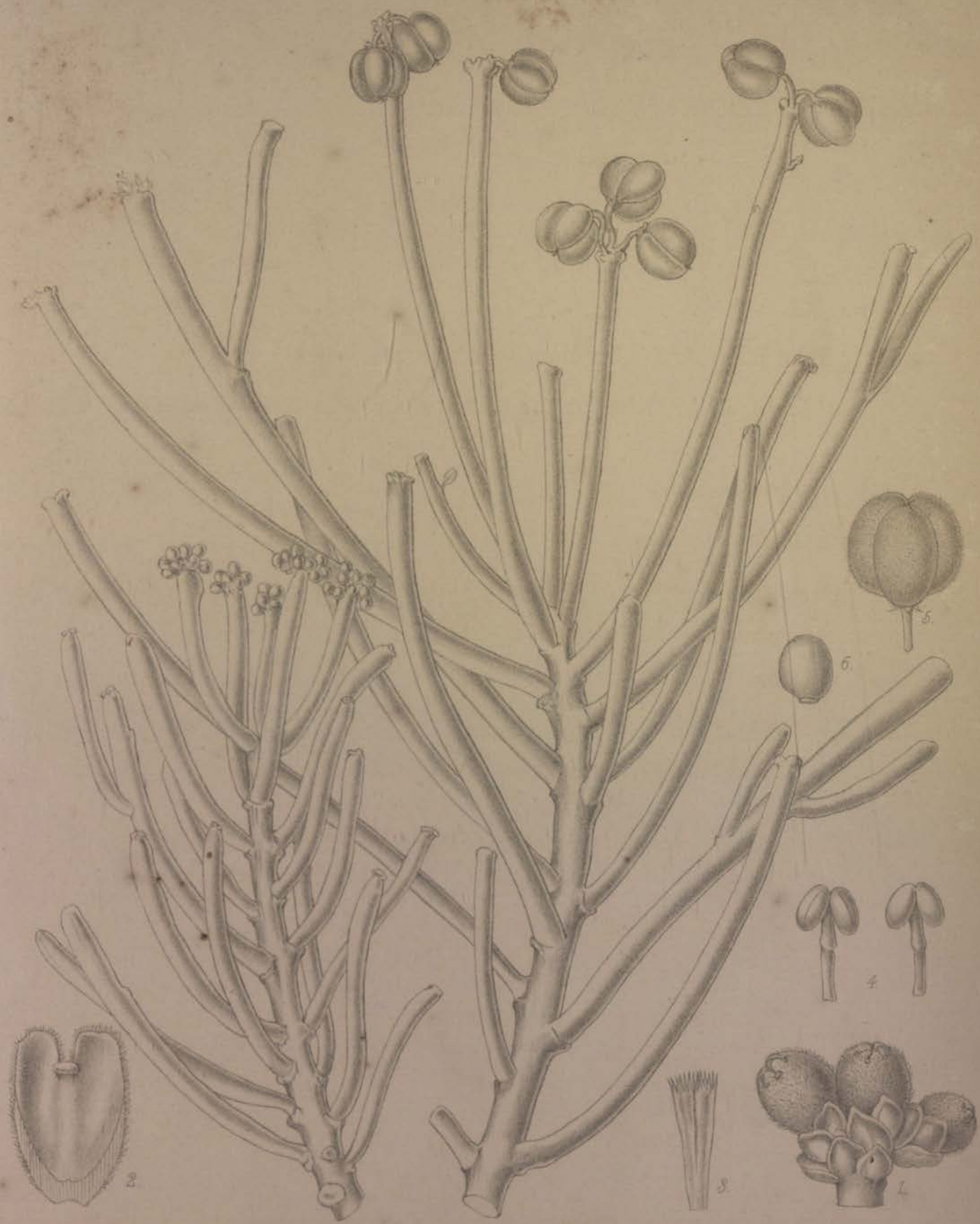
" 3. Interfloral bracteole.

" 4. Stamen, back and face views.

" 5. Fruit.

" 6. Seed.

All numbered figures magnified. Drawn from dried specimens.



Euphorbia arbuscula. *Balf. fil.*

TABULA XC.

Tab. XC. Jatropha unicostata, Balf. fil. Page 272.

Branch with inflorescence showing habit.

Fig. 1. Staminate flower expanded.

" 2. Calyx of staminate flower.

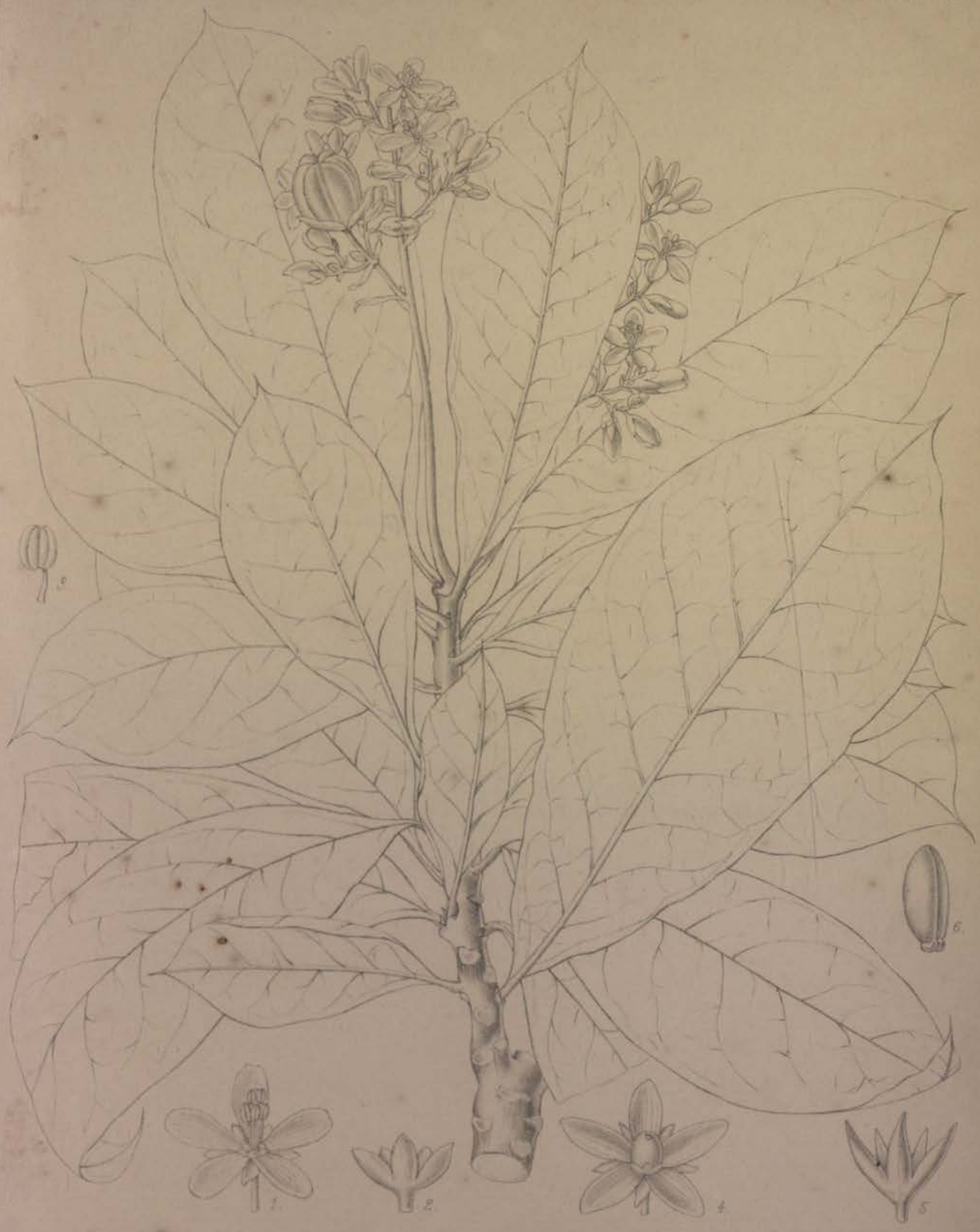
" 3. Anther.

" 4. Pistillate flower.

" 5. Calyx of pistillate flower.

" 6. Seed.

All numbered figures magnified. Drawn from dried specimens.



Jatropha unicostata, *Balf. fil.*

TABULA XCI.

Tab. XCI. Croton sarocarpus, Balf. fil. Page 273.

Two branches shown; that to the left with inflorescence; that the right with fruits.

Fig. 1. Portion of foliage-leaf and petiole.

" 2. Staminate flower.

" 3. Stellate hair.

" 4. Petal of staminate flower.

" 5. Stamen.

" 6. Pistillate flower.

" 7. Hair from fruit.

" 8. Seed.

All numbered figures magnified. Drawn from dried specimens.

Croton sarocarpus. *Balf. fil.*

TABULA XCII.

Tab. XCII. Croton sulcifructus, Balf. fil. Page 274.

Branch with inflorescence and fruit showing habit.

Fig. 1. Portion of foliage-leaf and petiole.

" 2. Staminate flower.

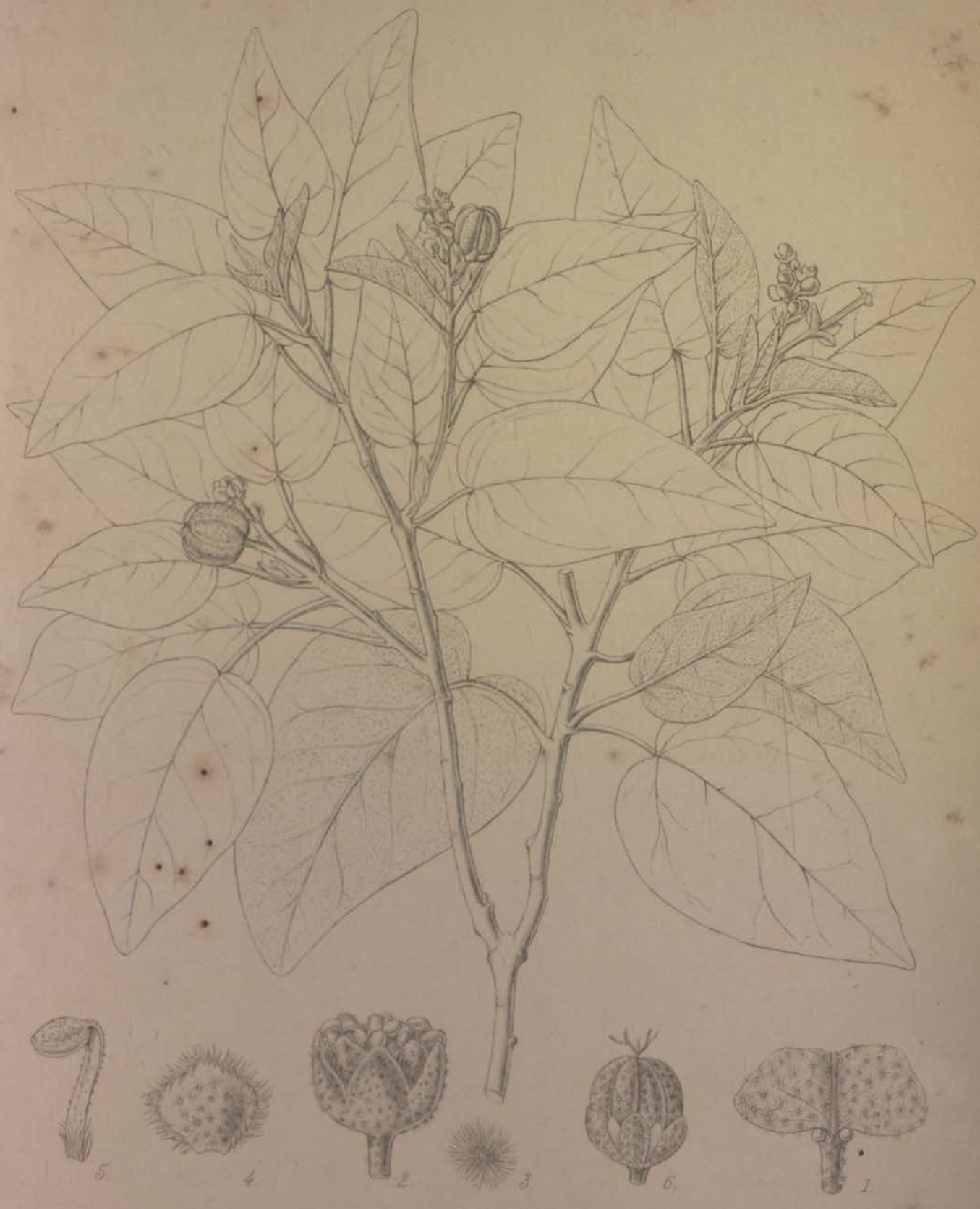
" 3. Stellate hair.

" 4. Petal of staminate flower.

" 5. Stamen.

" 6. Young fruit girt by calyx.

All numbered figures magnified. Drawn from dried specimens.



M. Smith. del.

M'Farlane & Erskine Lith.t Edin.r

Croton sulcifructus. *Balf. fil.*

TABULA XCIII.

Tab. XCIII. Croton socotranus, Balf. fil. Page 275.

Two branches showing habit; that to the right with flowers and large foliage-leaves; that to the left with fruits and smaller foliage-leaves.

Fig. 1. Portion of foliage-leaf and petiole.

" 2. Staminate flower.

" 3. Stamen.

" 4. Pistillate flower.

" 5. Hairs from fruit.

" 6. Seed.

All numbered figures magnified. Drawn from dried specimens.

M. Smith, del.

McFarlane & Erskine, Lith^rs Edin^r

Croton socotranus. *Balf. fil.*

TABULA XCIV.

Tab. XCIV. Cephalocroton socotranus, Balf. fil. Page 278.

Two branches showing habit; that on the left shows the form with small foliage-leaves; that on the right the form with large foliage-leaves.

Fig. 1. Staminate flower.

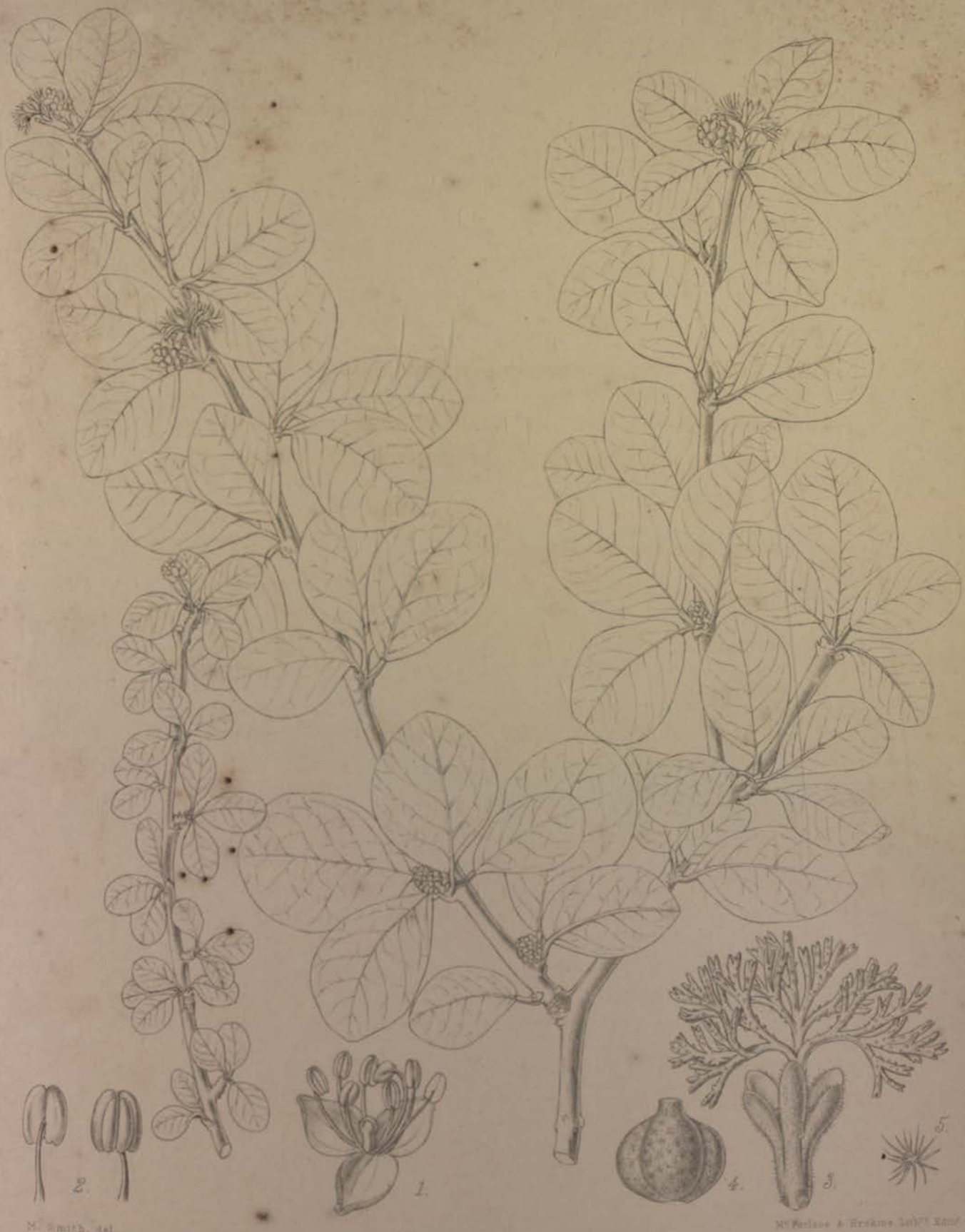
" 2. Stamen, back and face view.

" 3. Pistillate flower.

" 4. Ovary.

" 5. Stellate hair.

All numbered figures magnified. Drawn from dried specimens.



Cephalocroton socotranus. *Balf fil.*

TABULA XCV.

Tab. XCV. Dorstenia gigas, Schweinf. Page 280.

In the centre is shown a branch with inflorescences; on the right is extremity of a branch with foliage-leaves from a mature plant; the figure of a branch with small leaves in the right hand corner is from a young plant.

Fig. 1. Portion of a hypanthodium showing staminate flowers.

" 2. Staminate flower.

All numbered figures magnified. Drawn from dried specimens.

Dorstenia gigas. *Schweinf.*

TABULA XCVI.

Tab. XCVI. Dracæna Cinnabari, Balf. fil. Page 293.

The dragon's blood tree as sketched by Lieut. C. J. Cockburn. Two forms of the tree are shown.

Cockburn del.

Dracæna Cinnabari, *Balf. fil.*

J.N. Fitch imp.

TABULA XCVII.

Tab. XCVII. Dracæna Cinnabari, Bal. fil. Page 293.

Figs. 1, 2, and 3. Foliage-leaves.

Fig. 4. Portion of inflorescence.

" 5. Flower.

" 6. Dissected flower, three perianth-segments and three stamens removed.

" 7. Perianth-segment with stamen attached.

" 8. Ovary in transverse section.

" 9. Branch with fruit.

" 10. Fruit in vertical section.

" 11. Fruit in transverse section.

" 12. Seeds.

Figs. 1, 2, 3, 4, and 9, natural size; rest magnified. Drawn from dried and spirit-specimens.

J.N. Fitch del. et lith.

Dracæna Cinnabari, *Balf. fil.*

J.N. Fitch imp.

TABULA XCVIII.

Tab. XCVIII, A. Rhynchelytrum microstachyum, Balf. fil. Page 314.

Plant showing habit.

Fig. 1. Portion of leaf-sheath.

" 2. Spikelet.

" 3. Lowest glume.

" 4. Second glume.

" 5. Third (flowering) glume.

" 6. Palea.

" 7. Lower (empty) of the two upper glumes.

" 8. Upper (fertile) of the two upper glumes.

" 9. Gynæceum.

" 10. Spikelet from the variety **albicomum**, showing the second and third glume densely hairy.

B. Ischnurus pulchellus, Balf. fil. Page 323.

Plant showing habit.

Fig. 1. Portion of leaf sheath and lamina.

" 2. Portion of spike, face view.

" 3. Portion of spike, side view.

" 4. Lowest glume.

" 5. Flowering glume.

" 6. Palea.

" 7. Gynæceum.

All numbered figures magnified. Drawn from dried specimens.

A Rhynchelytrum microstachyum, *Balf fil.*
B Ischnurus pulchellus, *Balf fil.*

TABULA XCIX.

Tab. XCIX, A. Adiantum Balfourii, Baker. Page 325.

Plant showing habit.

Fig. 1. Pinna.

" 2. Portion of pinna showing sori.

" 3. Sporangium.

All numbered figures magnified. Drawn from dried specimens.

B. Symblepharis socotrana, Mitt. Page 331.

Fig. 1. Plant showing habit.

" 2. Leaves.

" 3. Old capsule.

Figs. 2 and 3 magnified. Drawn from dried specimens.

C. Frullania socotrana, Mitt. Page 335.

Fig. 1. Plant showing habit.

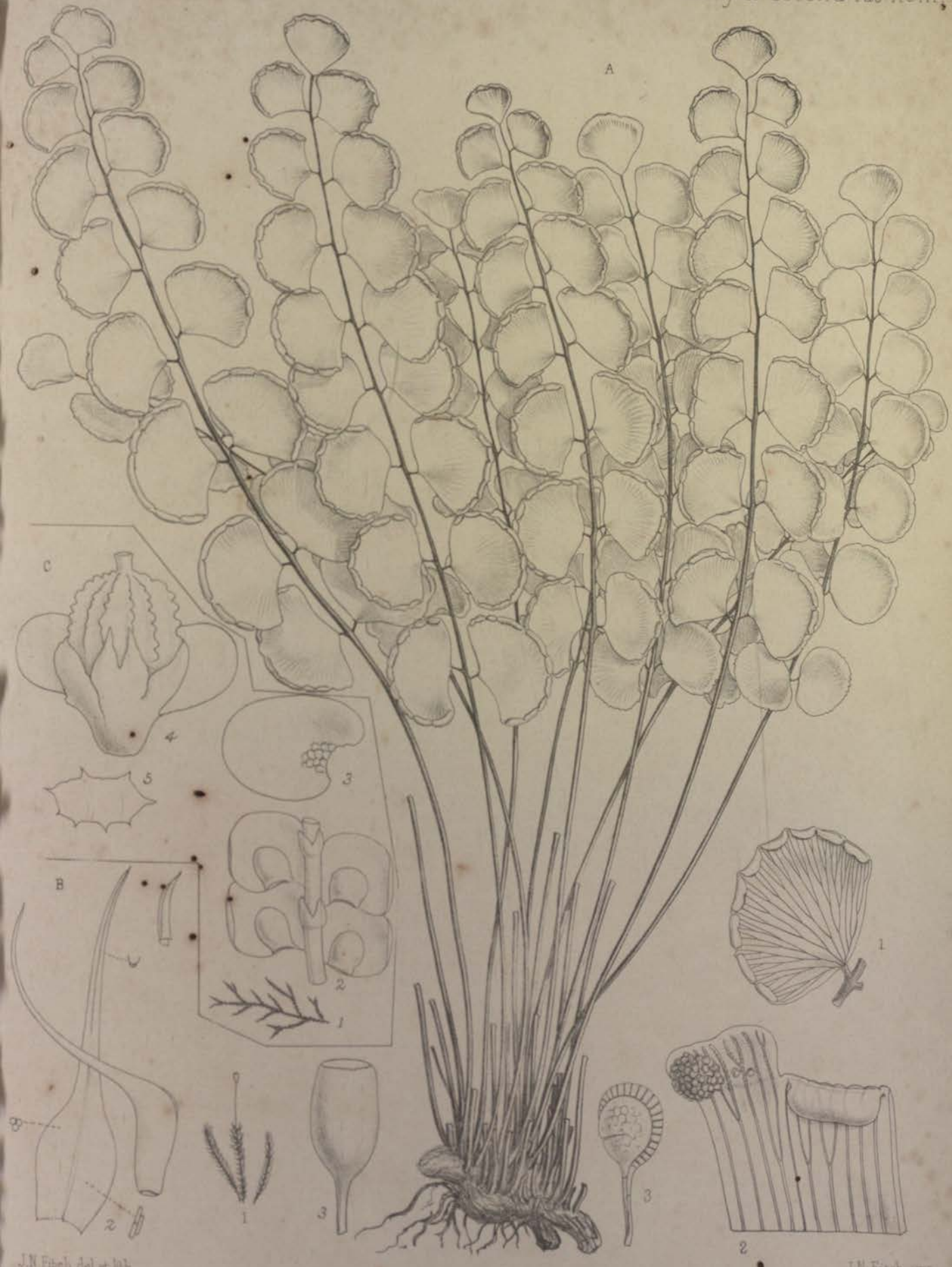
" 2. Portion of stem with leaves and stipules as seen from the under sid

" 3. Leaf detached without lobule.

" 4. Perianth as seen on under side, with leaves and stipules.

" 5. Transverse section of perianth.

1 natural size ; rest magnified. Drawn from dried specimens



J.N. Fitch del. et lith.

J.N. Fitch imp.

A. Adiantum Balfourii. *Baker*.
B. Symblepharis socotrana *Mitt*.
C. Frullania socotrana *Mitt*.

TABULA C.

Tab. C. Asplenium Schweinfurthii, Baker.

Plant showing habit.

Fig. 1. Pinna with sori.

" 2. Portion of pinna showing two sori.

" 3. Sporangium.

All numbered figures magnified. Drawn from dried specimens.

J.N. Fitch del. et lith. J.N. Fitch imp.

Asplenium Schweinfurthii *Baker*

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